OB[illegible] ET AL (703) 413-3000
INVENTOR Michel ARTHUR, ET AL.

USSN 09/357,375

FIG. 1

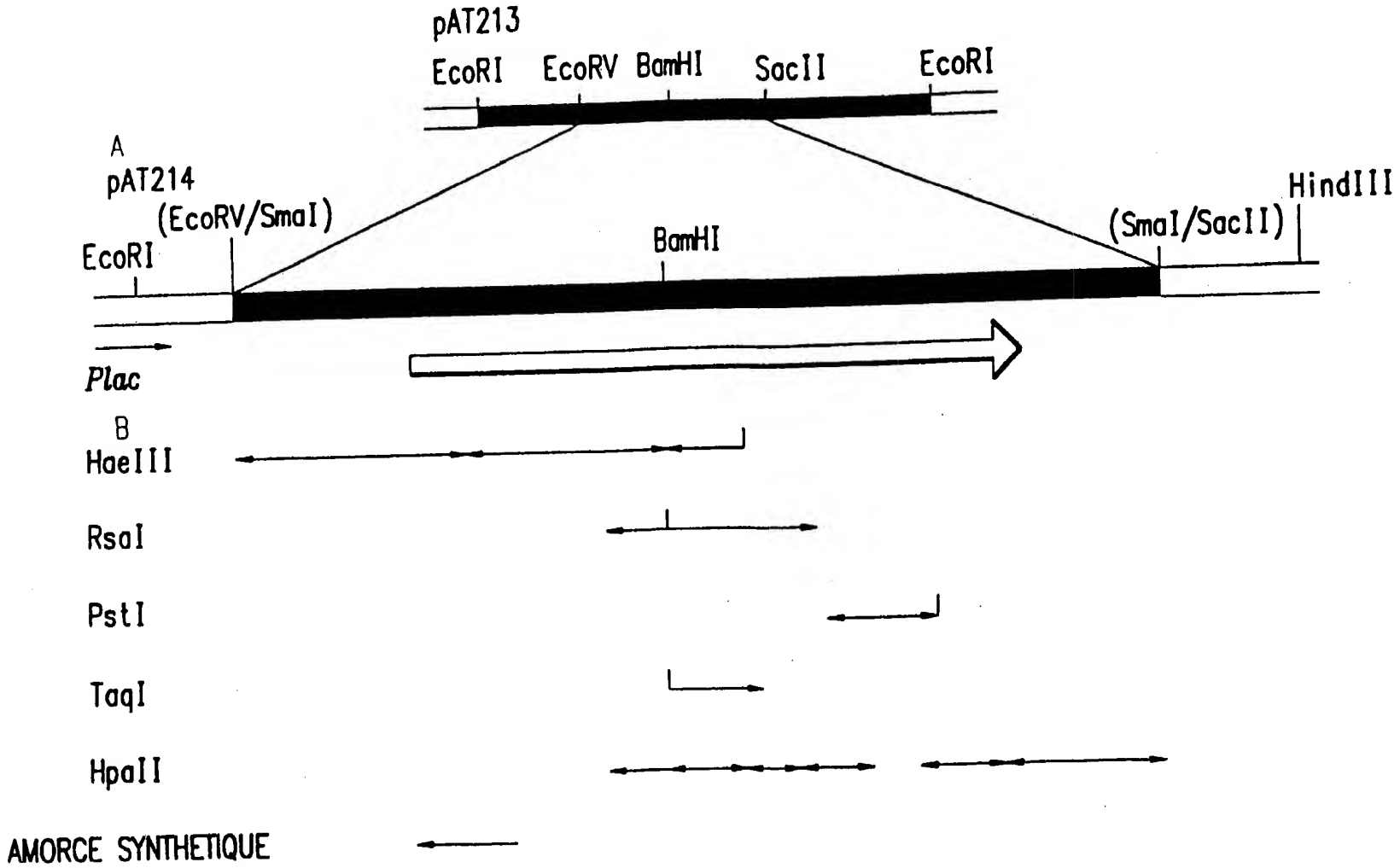


FIG.2

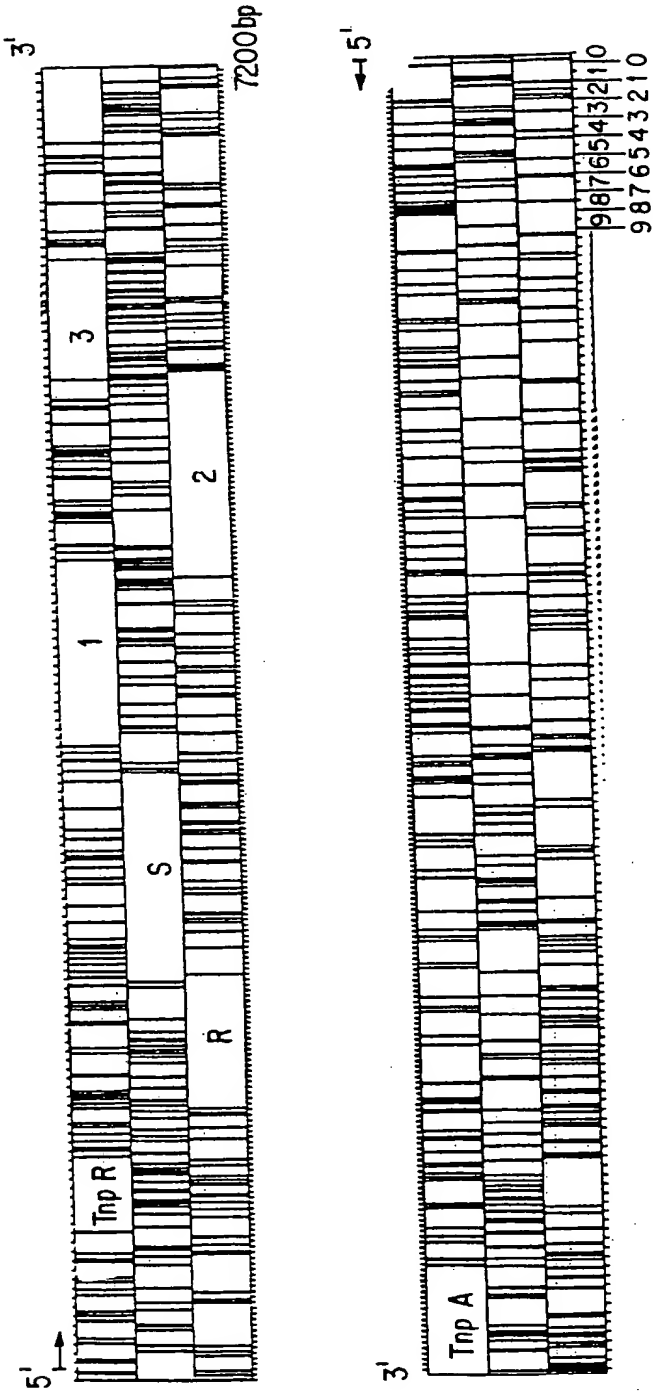


FIG. 3A

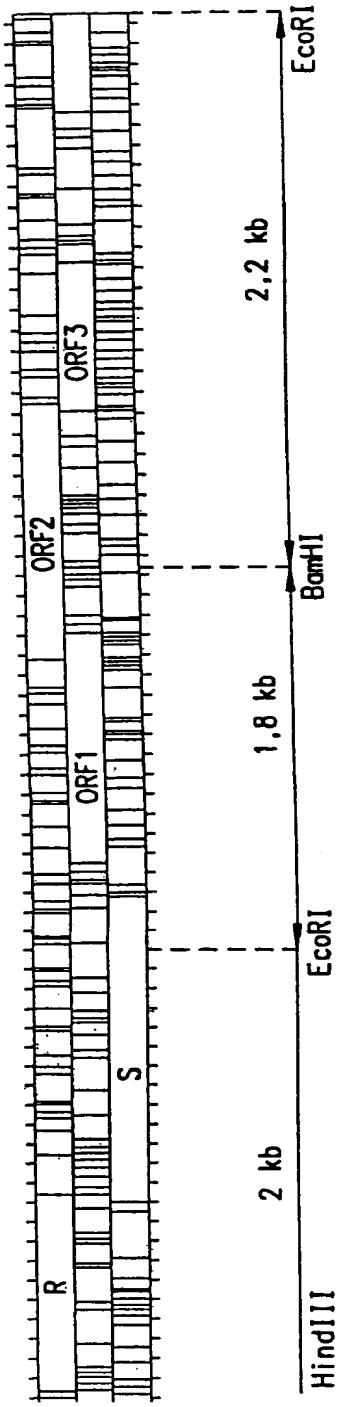


FIG. 3B

FIG. 4A

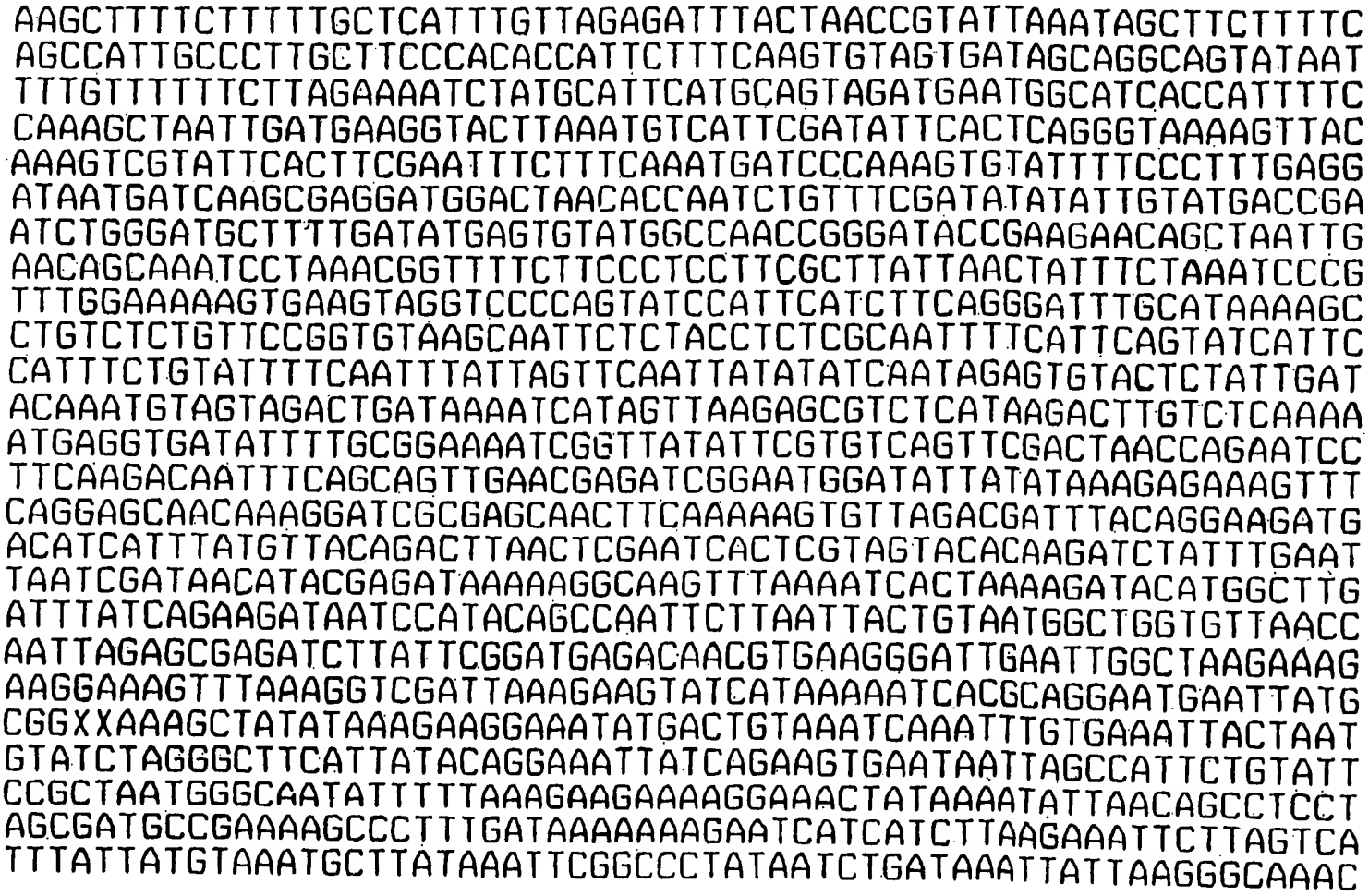


FIG. 4B

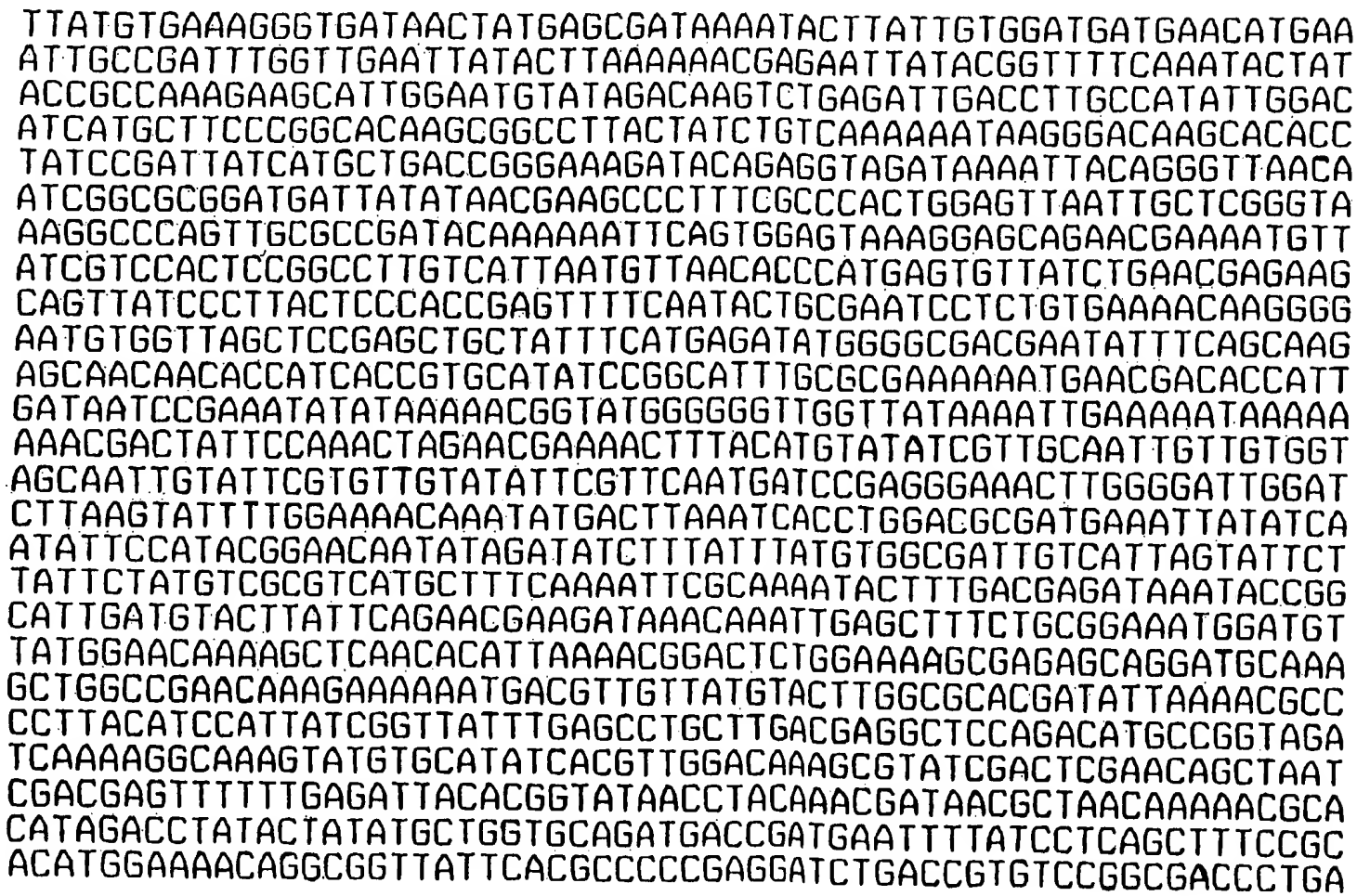
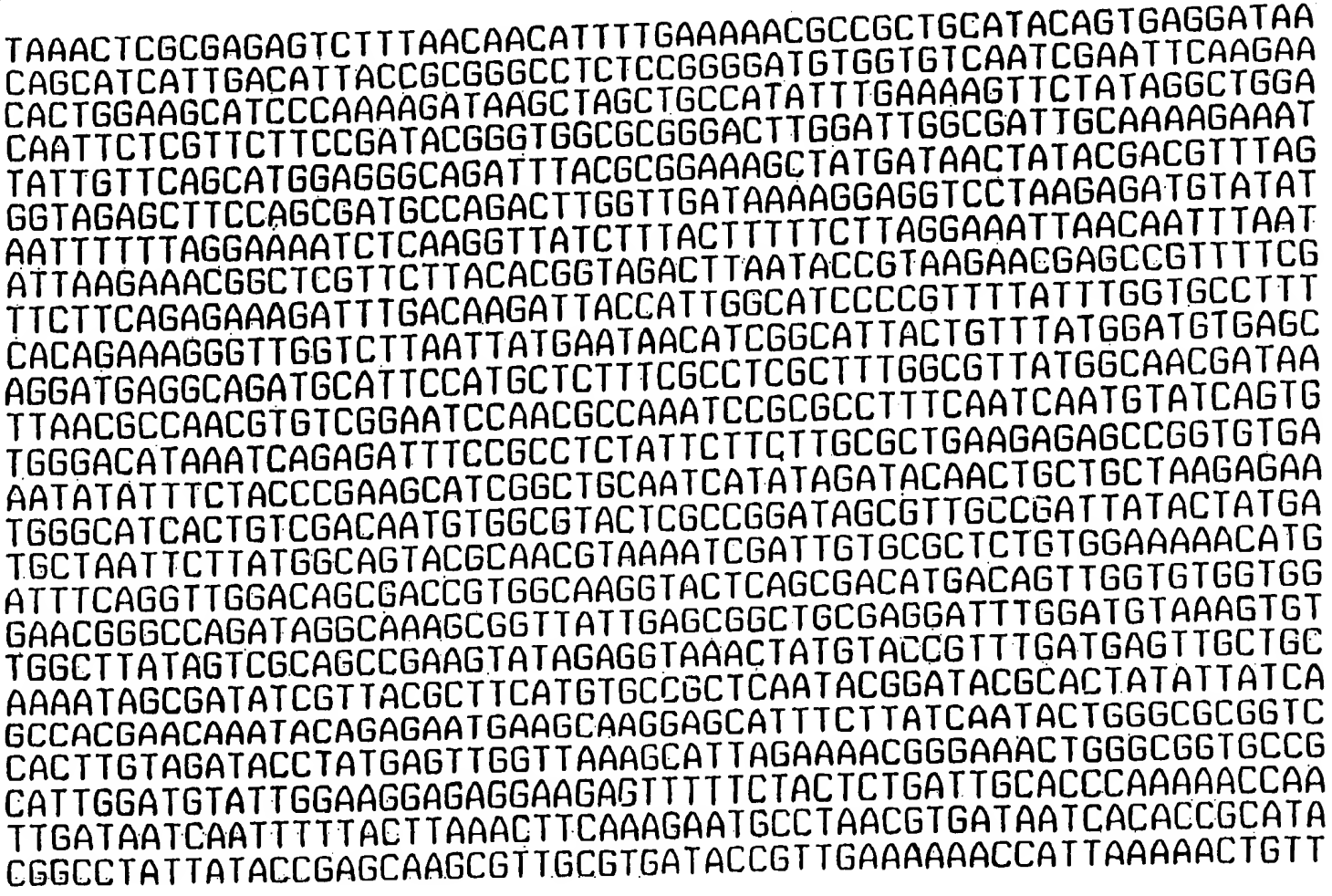


FIG. 4C



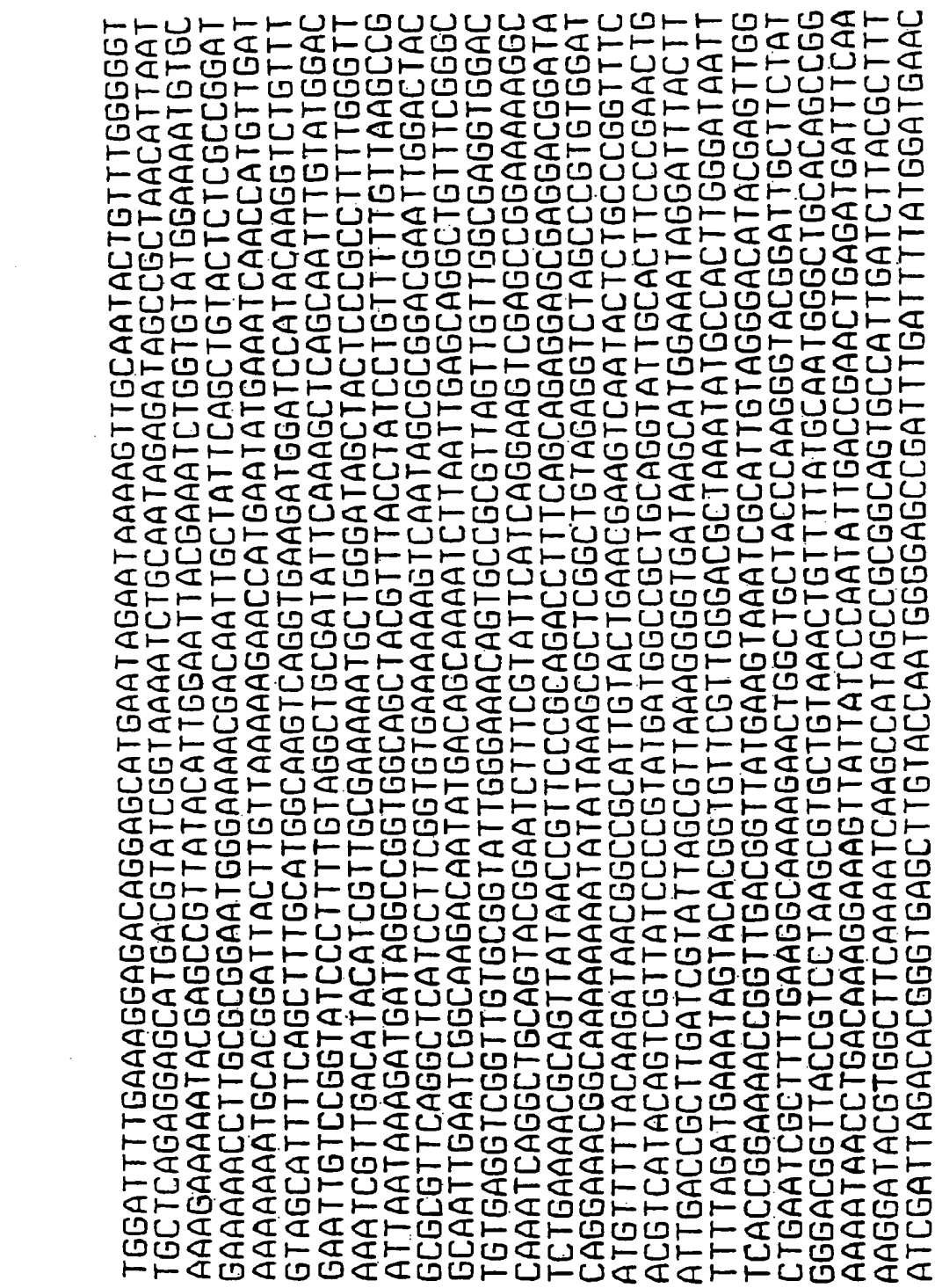
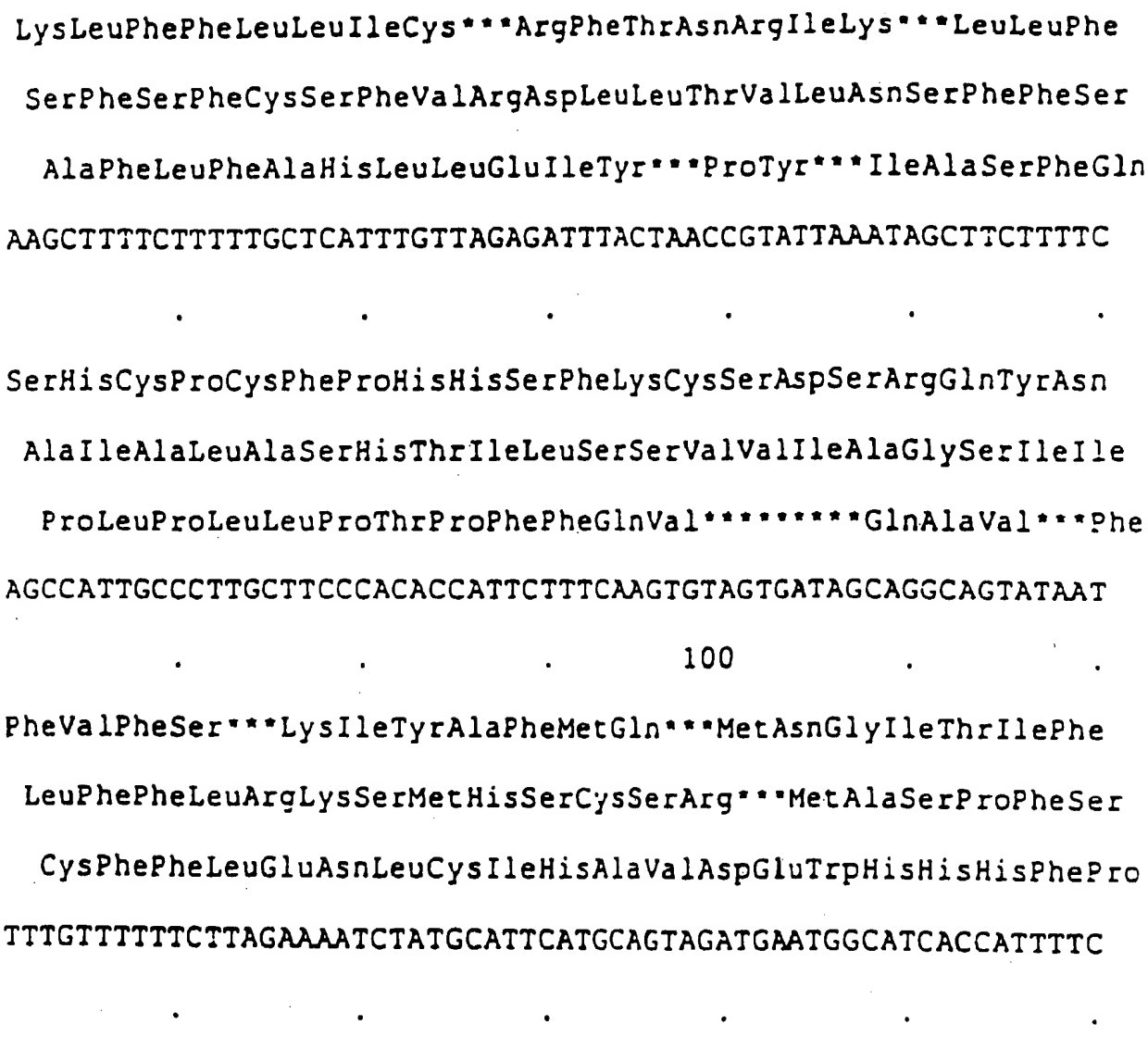


FIG. 4D

FIG. 4E

GCTCTCATCATGCGGCAAATGGAATATCATGCAATGAAGCGCAAAATCGCAGACGTTTGC
GCTCCATCATGGAAAACAGTGGGTTTGAAGCATATAGCCTCGAATGGTGGCACTATGTAT
TAAGAGACGAACCATACCCCAATAGCTATTTTGATTTCCCCGTTAAATAAACTTTTAACC
GTTGCACGGACAAACTATATAAGCTAACTCTTTCGGCAGGAAACCCGACGTATGTAACTG
GTTCTTAGGGAATTTATATATAGTAGATAGTATTGAAGATGTAAGGCAGAGCGATATTGC
GGTCATTATCTGCGTGCGCTGCGGCAAGATAGCCTGATAATAAGACTGATCGCATAGAGG
GGTGGTATTTCACACCGCCCATTGTCAACAGGCAGTTCAGCCTCGTTAAATTCAGCATGG
GTATCACTTATGAAAATTCATCTACATTGGTGATAATAGTAAATCCAGTAGGGCGAAATA
ATTGACTGTAATTTACGGGGCAAAACGGCACAATCTCAAACGAGATTGTGCCGTTTAAGG
GGAAGATTCTAGAAATATTTCATACTTCCAACTATATAGTTAAGGAGGAGACTGAAAATG
AAGAAGTTGTTTTTTTTATTGTTATTGTTATTCTTAATATACTTAGGTTATGACTACGTT
AATGAAGCACTGTTTTCTCAGGAAAAAGTCGAATTTCAAAATTATGATCAAAATCCCAAA
GAACATTTAGAAAATAGTGGGACTTCTGAAAATACCCAAGAGAAAACAATTACAGAAGAA
CAGGTTTATCAAGGAAATCTGCTATTAATCAATAGTAAATATCCTGTTCGCCAAGAAGTG
TGAAGTCAGATATCGTGAATTTATCTAAACATGACGAATTAATAAATGGATACGGGTTGC
TTGATAGTAATATTTATATGTCAAAAGAAATAGCACAAAAATTTTCAGAGATGGTCAATG
ATGCTGTAAAGGGTGGCGTTAGTCATTTTATTATTAATAGTGGCTATCGAGACTTTGATG
AGCAAAGTGTGCTTTACCAAGAAATGGGGGCTGAGTATGCCTTACCAGCAGGTTATAGTG
AGCATAATTCAGGTTTATCACTAGATGTAGGATCAAGCTTGACGAAAATGGAACGAGCCC
CTGAAGGAAAGTGGATAGAAGAAAATGCTTGGAAATACGGGTTCATTTTACGTTATCCAG
AGGACAAAACAGAGTTAACAGGAATTC

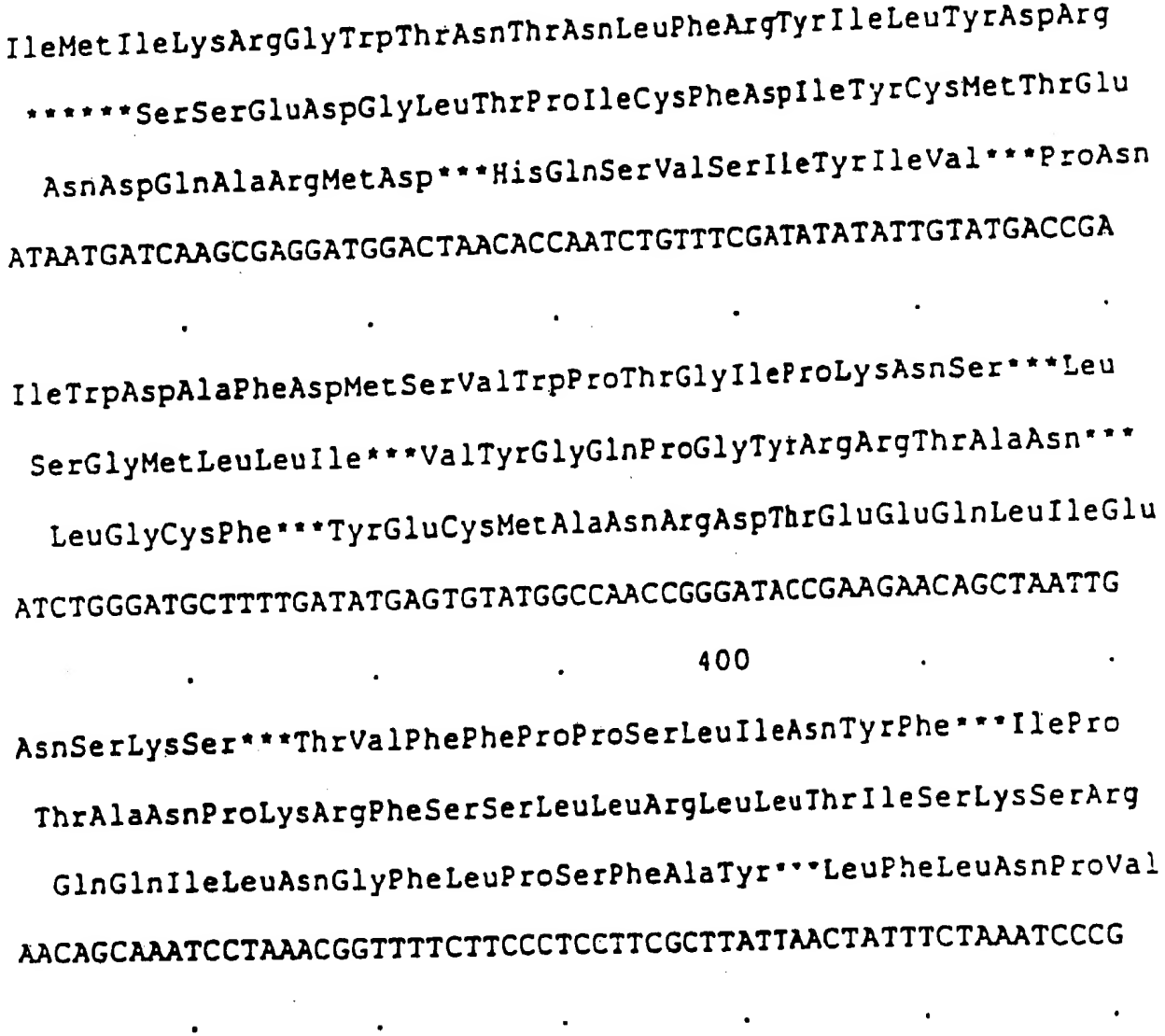
FIG. 5A



```
GlnSer***LeuMetLysValLeuLysCysHisSerIlePheThrGlnGlyLysSerTyr
 LysAlaAsn******ArgTyrLeuAsnValIleArgTyrSerLeuArgValLysValThr
  LysLeuIleAspGluGlyThr***MetSerPheAspIleHisSerGly***LysLeuGln
CAAAGCTAATTGATGAAGGTACTTAAATGTCATTCGATATTCACTCAGGGTAAAAGTTAC
         .       200       .       .       .       .
LysValValPheThrSerAsnPhePheGlnMetIleProLysCysIlePheProLeuArg
 LysSerTyrSerLeuArgIleSerPheLys***SerGlnSerValPheSerLeu***Gly
  SerArgIleHisPheGluPheLeuSerAsnAspProLysValTyrPheProPheGluAsp
AAAGTCGTATTCACTTCGAATTTCTTTCAAATGATCCCAAAGTGTATTTTCCCTTTGAGG
         .       .       .       .       .       300
```

FIG. 5B

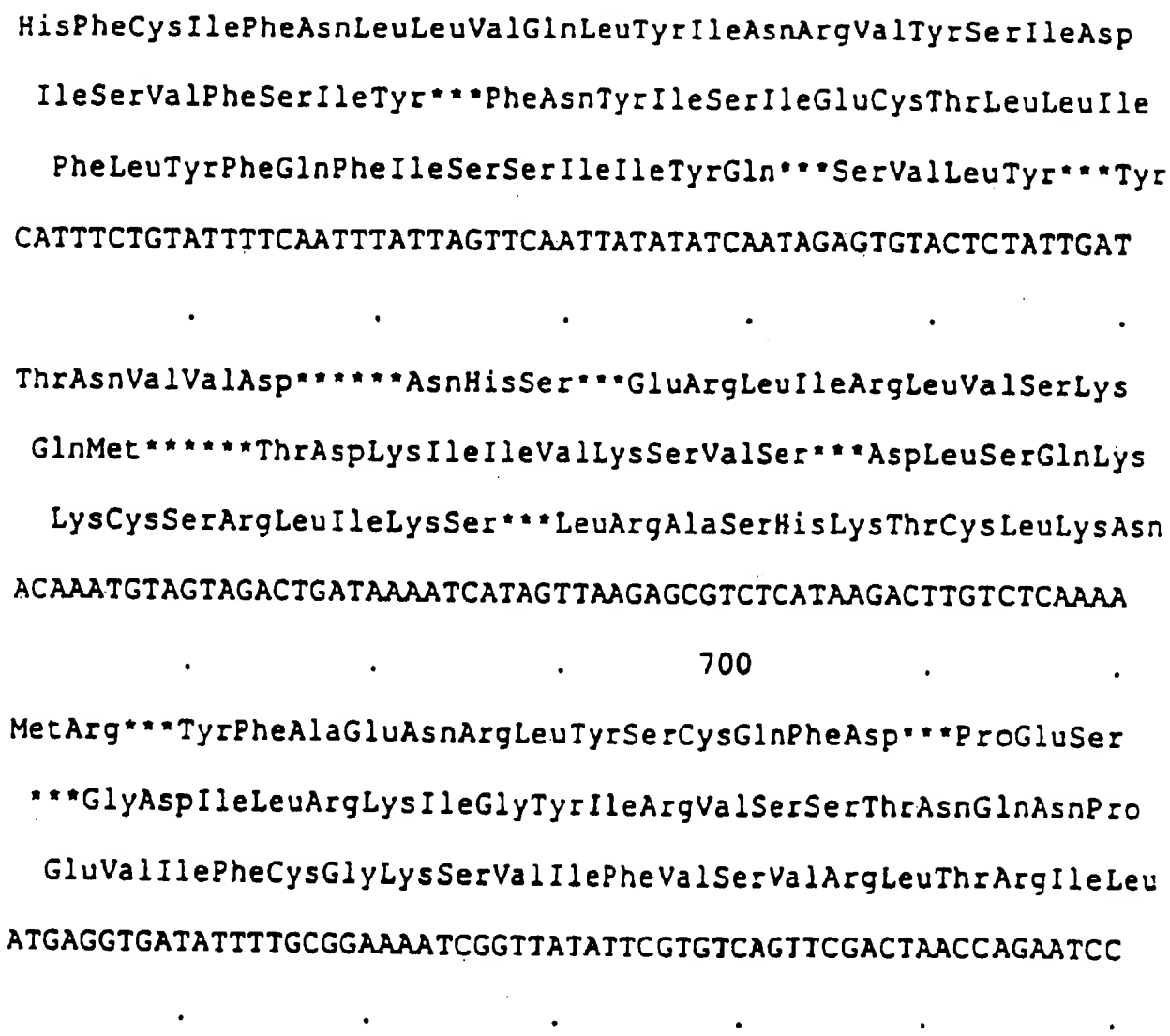
FIG. 5C



```
PheGlyLysSerGluValGlyProGlnTyrProPheIlePheArgAspLeuHisLysSer
 LeuGluLysValLys***ValProSerIleHisSerSerSerGlyIleCysIleLysAla
  TrpLysLys***SerArgSerProValSerIleHisLeuGlnGlyPheAla***LysPro
TTTGGAAAAAGTGAAGTAGGTCCCCAGTATCCATTCATCTTCAGGGATTTGCATAAAAGC
         .       500       .       .       .       .
LeuSerLeuPheArgCysLysGlnPheSerThrSerArgAsnPheHisSerValSerPhe
 CysLeuCysSerGlyValSerAsnSerLeuProLeuAlaIlePheIleGlnTyrHisSer
  ValSerValProVal***AlaIleLeuTyrLeuSerGlnPheSerPheSerIleIlePro
CTGTCTCTGTTCCGGTGTAAGCAATTCTCTACCTCTCGCAATTTTCATTCAGTATCATTC
         .       .       .       .       .       600
```

FIG. 5D

FIG. 5E



PheLysThrIleSerAlaValGluArgAspArgAsnGlyTyrTyrIleLysArgLysPhe

SerArgGlnPheGlnGlnLeuAsnGluIleGlyMetAspIleIle***ArgGluSerPhe

GlnAspAsnPheSerSer***ThrArgSerGluTrpIleLeuTyrLysGluLysValSer

TTCAAGACAATTTCAGCAGTTGAACGAGATCGGAATGGATATTATATAAAGAGAAAGTTT

. 800 . . . .

GlnGluGlnGlnArgIleAlaSerAsnPheLysLysCys***ThrIleTyrArgLysMet

ArgSerAsnLysGlySerArgAlaThrSerLysSerValArgArgPheThrGlyArg***

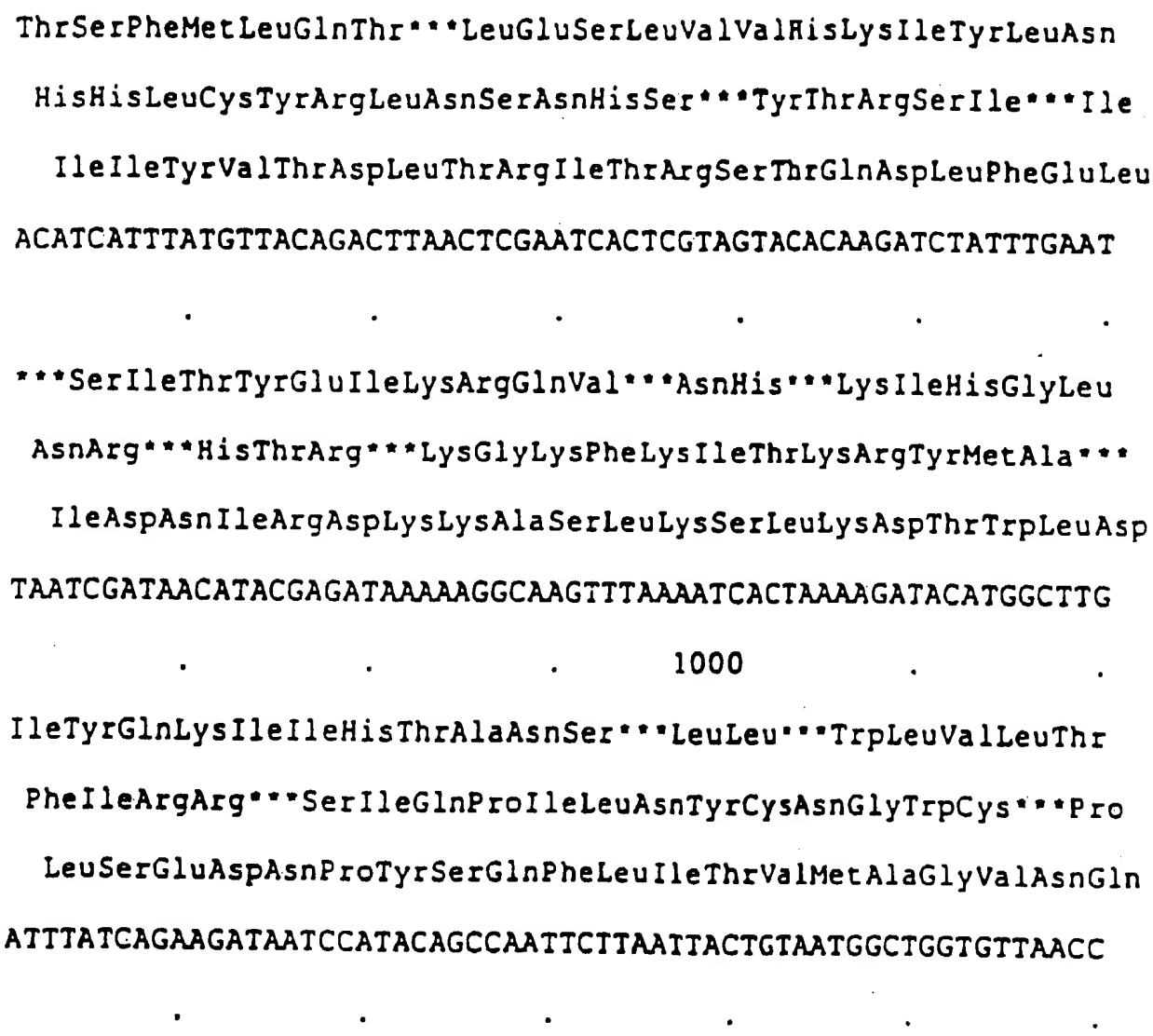
GlyAlaThrLysAspArgGluGlnLeuGlnLysValLeuAspAspLeuGlnGluAspAsp

CAGGAGCAACAAAGGATCGCGAGCAACTTCAAAAAGTGTTAGACGATTTACAGGAAGATG

. 900

FIG. 5F

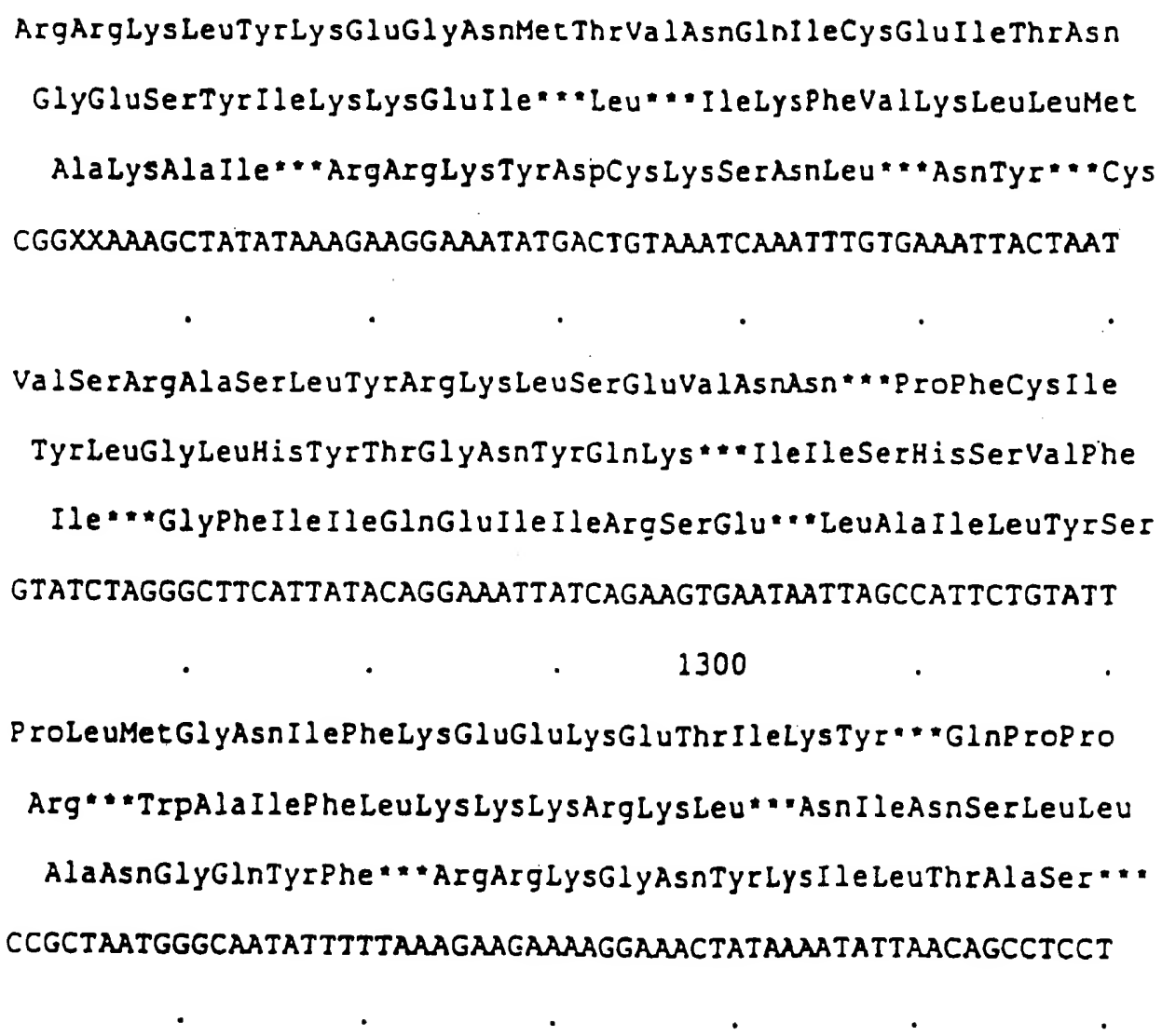
FIG. 5G



```
Asn***SerGluIleLeuPheGly***AspAsnValLysGlyLeuAsnTrpLeuArgLys
 IleArgAlaArgSerTyrSerAspGluThrThr***ArgAsp***IleGly***GluArg
  LeuGluArgAspLeuIleArgMetArgGlnArgGluGlyIleGluLeuAlaLysLysGlu
AATTAGAGCGAGATCTTATTCGGATGAGACAACGTGAAGGGATTGAATTGGCTAAGAAAG
          .      1100        .        .        .        .
LysGluSerLeuLysValAsp***ArgSerIleIleLysIleThrGlnGlu***IleMet
 ArgLysVal***ArgSerIleLysGluValSer***LysSerArgArgAsnGluLeuCys
  GlyLysPheLysGlyArgLeuLysLysTyrHisLysAsnHisAlaGlyMetAsnTyrAla
AAGGAAAGTTTAAAGGTCGATTAAAGAAGTATCATAAAAATCACGCAGGAATGAATTATG
                                                        1200
```

FIG. 5H

FIG. 5I



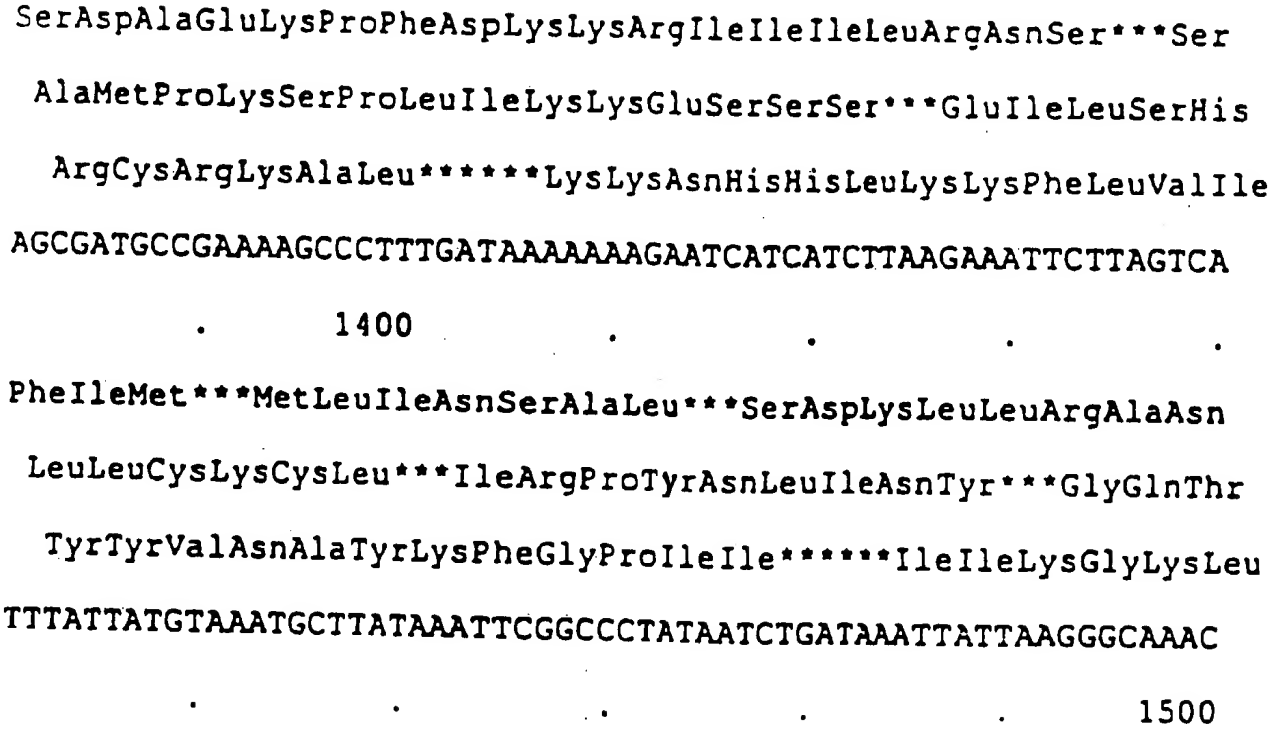


FIG. 5J

```
LeuCysGluArgValIleThrMetSerAspLysIleLeuIleValAspAspGluHisGlu
 TyrValLysGly******Leu***AlaIleLysTyrLeuLeuTrpMetMetAsnMetLys
  Met***LysGlyAspAsnTyrGluArg***AsnThrTyrCysGly******Thr***Asn
TTATGTGAAAGGGTGATAACTATGAGCGATAAAATACTTATTGTGGATGATGAACATGAA
          .       .       .       .       .       .
IleAlaAspLeuValGluLeuTyrLeuLysAsnGluAsnTyrThrValPheLysTyrTyr
 LeuProIleTrpLeuAsnTyrThr***LysThrArgIleIleArgPheSerAsnThrIle
  CysArgPheGly***IleIleLeuLysLysArgGluLeuTyrGlyPheGlnIleLeuTyr
ATTGCCGATTTGGTTGAATTATACTTAAAAAACGAGAATTATACGGTTTTCAAATACTAT
          .       .       .    1600       .       .
ThrAlaLysGluAlaLeuGluCysIleAspLysSerGluIleAspLeuAlaIleLeuAsp
 ProProLysLysHisTrpAsnVal***ThrSerLeuArgLeuThrLeuProTyrTrpThr
  ArgGlnArgSerIleGlyMetTyrArgGlnVal***Asp***ProCysHisIleGlyHis
ACCGCCAAAGAAGCATTGGAATGTATAGACAAGTCTGAGATTGACCTTGCCATATTGGAC
          .       .       .       .       .       .
```

FIG. 5K

IleMetLeuProGlyThrSerGlyLeuThrIleCysGlnLysIleArgAspLysHisThr

SerCysPheProAlaGlnAlaAlaLeuLeuSerValLysLys***GlyThrSerThrPro

HisAlaSerArgHisLysArgProTyrTyrLeuSerLysAsnLysGlyGlnAlaHisLeu

ATCATGCTTCCCGGCACAAGCGGCCTTACTATCTGTCAAAAAATAAGGGACAAGCACACC

. 1700 . . . .

TyrProIleIleMetLeuThrGlyLysAspThrGluValAspLysIleThrGlyLeuThr

IleArgLeuSerCys***ProGlyLysIleGlnArg***IleLysLeuGlnGly***Gln

SerAspTyrHisAlaAspArgGluArgTyrArgGlyArg***AsnTyrArgValAsnAsn

TATCCGATTATCATGCTGACCGGGAAAGATACAGAGGTAGATAAAATTACAGGGTTAACA

. 1800

FIG. 5L

```
IleGlyAlaAspAspTyrIleThrLysProPheArgProLeuGluLeuIleAlaArgVal
 SerAlaArgMetIleIle***ArgSerProPheAlaHisTrpSer***LeuLeuGly***
  ArgArgGly***LeuTyrAsnGluAlaLeuSerProThrGlyValAsnCysSerGlyLys
ATCGGCGCGGATGATTATATAACGAAGCCCTTTCGCCCACTGGAGTTAATTGCTCGGGTA
          .         .         .         .         .         .
LysAlaGlnLeuArgArgTyrLysLysPheSerGlyValLysGluGlnAsnGluAsnVal
 ArgProSerCysAlaAspThrLysAsnSerValGlu***ArgSerArgThrLysMetLeu
  GlyProValAlaProIleGlnLysIleGlnTrpSerLysGlyAlaGluArgLysCysTyr
AAGGCCCAGTTGCGCCGATACAAAAAATTCAGTGGAGTAAAGGAGCAGAACGAAAATGTT
          .         .         .      1900       .         .
IleValHisSerGlyLeuValIleAsnValAsnThrHisGluCysTyrLeuAsnGluLys
 SerSerThrProAlaLeuSerLeuMetLeuThrProMetSerValIle***ThrArgSer
  ArgProLeuArgProCysHis***Cys***HisPro***ValLeuSerGluArgGluAla
ATCGTCCACTCCGGCCTTGTCATTAATGTTAACACCCATGAGTGTTATCTGAACGAGAAG
          .         .         .         .         .         .
```

FIG. 5M

GlnLeuSerLeuThrProThrGluPheSerIleLeuArgIleLeuCysGluAsnLysGly

SerTyrProLeuLeuProProSerPheGlnTyrCysGluSerSerValLysThrArgGly

ValIleProTyrSerHisArgValPheAsnThrAlaAsnProLeu***LysGlnGlyGlu

CAGTTATCCCTTACTCCCACCGAGTTTTCAATACTGCGAATCCTCTGTGAAAACAAGGGG

2000

AsnValValSerSerGluLeuLeuPheHisGluIleTrpGlyAspGluTyrPheSerLys

MetTrpLeuAlaProSerCysTyrPheMetArgTyrGlyAlaThrAsnIleSerAlaArg

CysGly***LeuArgAlaAlaIleSer***AspMetGlyArgArgIlePheGlnGlnGlu

AATGTGGTTAGCTCCGAGCTGCTATTTCATGAGATATGGGGCGACGAATATTTCAGCAAG

2100

FIG. 5N

```
SerAsnAsnThrIleThrValHisIleArgHisLeuArgGluLysMetAsnAspThrIle
 AlaThrThrProSerProCysIleSerGlyIleCysAlaLysLys***ThrThrProLeu
  GlnGlnHisHisHisArgAlaTyrProAlaPheAlaArgLysAsnGluArgHisHis***
AGCAACAACACCATCACCGTGCATATCCGGCATTTGCGCGAAAAAATGAACGACACCATT
          .       .       .       .       .       .
AspAsnProLysTyrIleLysThrValTrpGlyValGlyTyrLysIleGluLys***Lys
 IleIleArgAsnIle***LysArgTyrGlyGlyLeuValIleLysLeuLysAsnLysLys
  ***SerGluIleTyrLysAsnGlyMetGlyGlyTrpLeu***Asn***LysIleLysLys
GATAATCCGAAATATATAAAAACGGTATGGGGGGTTGGTTATAAAATTGAAAAATAAAAA
          .       .       .    2200       .       .
LysArgLeuPheGlnThrArgThrLysThrLeuHisValTyrArgCysAsnCysCysGly
 AsnAspTyrSerLysLeuGluArgLysLeuTyrMetTyrIleValAlaIleValValVal
  ThrThrIleProAsn***AsnGluAsnPheThrCysIleSerLeuGlnLeuLeuTrp***
AAACGACTATTCCAAACTAGAACGAAAACTTTACATGTATATCGTTGCAATTGTTGTGGT
          .       .       .       .       .       .
```

FIG. 50

```
SerAsnCysIleArgValValTyrSerPheAsnAspProArgGluThrTrpGlyLeuAsp
 AlaIleValPheValLeuTyrIleArgSerMetIleArgGlyLysLeuGlyAspTrpIle
  GlnLeuTyrSerCysCysIlePheValGln***SerGluGlyAsnLeuGlyIleGlySer
AGCAATTGTATTCGTGTTGTATATTCGTTCAATGATCCGAGGGAAACTTGGGGATTGGAT
          .      2300        .         .         .         .
LeuLysTyrPheGlyLysGlnIle***LeuLysSerProGlyArgAspGluIleIleSer
 LeuSerIleLeuGluAsnLysTyrAspLeuAsnHisLeuAspAlaMetLysLeuTyrGln
  ***ValPheTrpLysThrAsnMetThr***IleThrTrpThrArg***AsnTyrIleAsn
CTTAAGTATTTTGGAAAACAAATATGACTTAAATCACCTGGACGCGATGAAATTATATCA
          .         .         .         .         .      2400
```

FIG. 5P

FIG. 5Q

```
 IlePheHisThrGluGlnTyrArgTyrLeuTyrLeuCysGlyAspCysHis***TyrSer

  TyrSerIleArgAsnAsnIleAspIlePheIleTyrValAlaIleValIleSerIleLeu

   IleProTyrGlyThrIle***IleSerLeuPheMetTrpArgLeuSerLeuValPheLeu

ATATTCCATACGGAACAATATAGATATCTTTATTTATGTGGCGATTGTCATTAGTATTCT

         .         .         .         .         .         .

TyrSerMetSerArgHisAlaPheLysIleArgLysIleLeu***ArgAspLysTyrArg

 IleLeuCysArgValMetLeuSerLysPheAlaLysTyrPheAspGluIleAsnThrGly

  PheTyrValAlaSerCysPheGlnAsnSerGlnAsnThrLeuThrArg***IleProAla

TATTCTATGTCGCGTCATGCTTTCAAAATTCGCAAAATACTTTGACGAGATAAATACCGG

         .         .         .      2500       .         .

His***CysThrTyrSerGluArgArg***ThrAsn***AlaPheCysGlyAsnGlyCys

 IleAspValLeuIleGlnAsnGluAspLysGlnIleGluLeuSerAlaGluMetAspVal

  LeuMetTyrLeuPheArgThrLysIleAsnLysLeuSerPheLeuArgLysTrpMetLeu

CATTGATGTACTTATTCAGAACGAAGATAAACAAATTGAGCTTTCTGCGGAAATGGATGT

         .         .         .         .         .         .
```

TyrGlyThrLysAlaGlnHisIleLysThrAspSerGlyLysAlaArgAlaGlyCysLys

MetGluGlnLysLeuAsnThrLeuLysArgThrLeuGluLysArgGluGlnAspAlaLys

TrpAsnLysSerSerThrHis***AsnGlyLeuTrpLysSerGluSerArgMetGlnSer

TATGGAACAAAAGCTCAACACATTAAAACGGACTCTGGAAAAGCGAGAGCAGGATGCAAA

2600

AlaGlyArgThrLysLysLys***ArgCysTyrValLeuGlyAlaArgTyr***AsnAla

LeuAlaGluGlnArgLysAsnAspValValMetTyrLeuAlaHisAspIleLysThrPro

TrpProAsnLysGluLysMetThrLeuLeuCysThrTrpArgThrIleLeuLysArgPro

GCTGGCCGAACAAAGAAAAAATGACGTTGTTATGTACTTGGCGCACGATATTAAAACGCC

2700

FIG. 5R

FIG. 5S

```
ProTyrIleHisTyrArgLeuPheGluProAla***ArgGlySerArgHisAlaGlyArg
 LeuThrSerIleIleGlyTyrLeuSerLeuLeuAspGluAlaProAspMetProValAsp
  LeuHisProLeuSerValIle***AlaCysLeuThrArgLeuGlnThrCysArg***Ile
CCTTACATCCATTATCGGTTATTTGAGCCTGCTTGACGAGGCTCCAGACATGCCGGTAGA

SerLysGlyLysValCysAlaTyrHisValGlyGlnSerValSerThrArgThrAlaAsn
 GlnLysAlaLysTyrValHisIleThrLeuAspLysAlaTyrArgLeuGluGlnLeuIle
  LysArgGlnSerMetCysIleSerArgTrpThrLysArgIleAspSerAsnSer***Ser
TCAAAAGGCAAAGTATGTGCATATCACGTTGGACAAAGCGTATCGACTCGAACAGCTAAT

                          2800

ArgArgValPhe***AspTyrThrVal***ProThrAsnAspAsnAlaAsnLysAsnAla
 AspGluPhePheGluIleThrArgTyrAsnLeuGlnThrIleThrLeuThrLysThrHis
  ThrSerPheLeuArgLeuHisGlyIleThrTyrLysArg***Arg***GlnLysArgThr
CGACGAGTTTTTTGAGATTACACGGTATAACCTACAAACGATAACGCTAACAAAAACGCA
```

HisArgProIleLeuTyrAlaGlyAlaAspAspArg***IleLeuSerSerAlaPheArg

IleAspLeuTyrTyrMetLeuValGlnMetThrAspGluPheTyrProGlnLeuSerAla

ThrTyrThrIleCysTrpCysArgProMetAsnPheIleLeuSerPheProHis

CATAGACCTATACTATATGCTGGTGCAGATGACCGATGAATTTTATCCTCAGCTTTCCGC

. 2900 . . . .

ThrTrpLysThrGlyGlyTyrSerArgProArgGlySerAspArgValArgArgPro***

HisGlyLysGlnAlaValIleHisAlaProGluAspLeuThrValSerGlyAspProAsp

MetGluAsnArgArgLeuPheThrProProArgIle***ProCysProAlaThrLeuIle

ACATGGAAAACAGGCGGTTATTCACGCCCCCGAGGATCTGACCGTGTCCGGCGACCCTGA

. 3000

FIG. 5T

FIG. 5U

```
***ThrArgGluSerLeu***GlnHisPheGluLysArgArgCysIleGln***Gly***
 LysLeuAlaArgValPheAsnAsnIleLeuLysAsnAlaAlaAlaTyrSerGluAspAsn
  AsnSerArgGluSerLeuThrThrPhe***LysThrProLeuHisThrValArgIleThr
TAAACTCGCGAGAGTCTTTAACAACATTTTGAAAAACGCCGCTGCATACAGTGAGGATAA
          .       .       .       .       .       .

GlnHisHis***HisTyrArgGlyProLeuArgGlyCysGlyValAsnArgIleGlnGlu
 SerIleIleAspIleThrAlaGlyLeuSerGlyAspValValSerIleGluPheLysAsn
  AlaSerLeuThrLeuProArgAlaSerProGlyMetTrpCysGlnSerAsnSerArgThr
CAGCATCATTGACATTACCGCGGGCCTCTCCGGGGATGTGGTGTCAATCGAATTCAAGAA
          .       .       .    3100       .       .

HisTrpLysHisProLysArg***AlaSerCysHisIle***LysValLeu***AlaGly
 ThrGlySerIleProLysAspLysLeuAlaAlaIlePheGluLysPheTyrArgLeuAsp
  LeuGluAlaSerGlnLysIleSer***LeuProTyrLeuLysSerSerIleGlyTrpThr
CACTGGAAGCATCCCAAAAGATAAGCTAGCTGCCATATTTGAAAAGTTCTATAGGCTGGA
          .       .       .       .       .       .
```

GlnPheSerPhePheArgTyrGlyTrpArgGlyThrTrpIleGlyAspCysLysArgAsn

AsnSerArgSerSerAspThrGlyGlyAlaGlyLeuGlyLeuAlaIleAlaLysGluIle

IleLeuValLeuProIleArgValAlaArgAspLeuAspTrpArgLeuGlnLysLysLeu

CAATTCTCGTTCTTCCGATACGGGTGGCGCGGGACTTGGATTGGCGATTGCAAAAGAAAT

. 3200 . . . .

TyrCysSerAlaTrpArgAlaAspLeuArgGlyLysLeu******LeuTyrAspVal***

IleValGlnHisGlyGlyGlnIleTyrAlaGluSerTyrAspAsnTyrThrThrPheArg

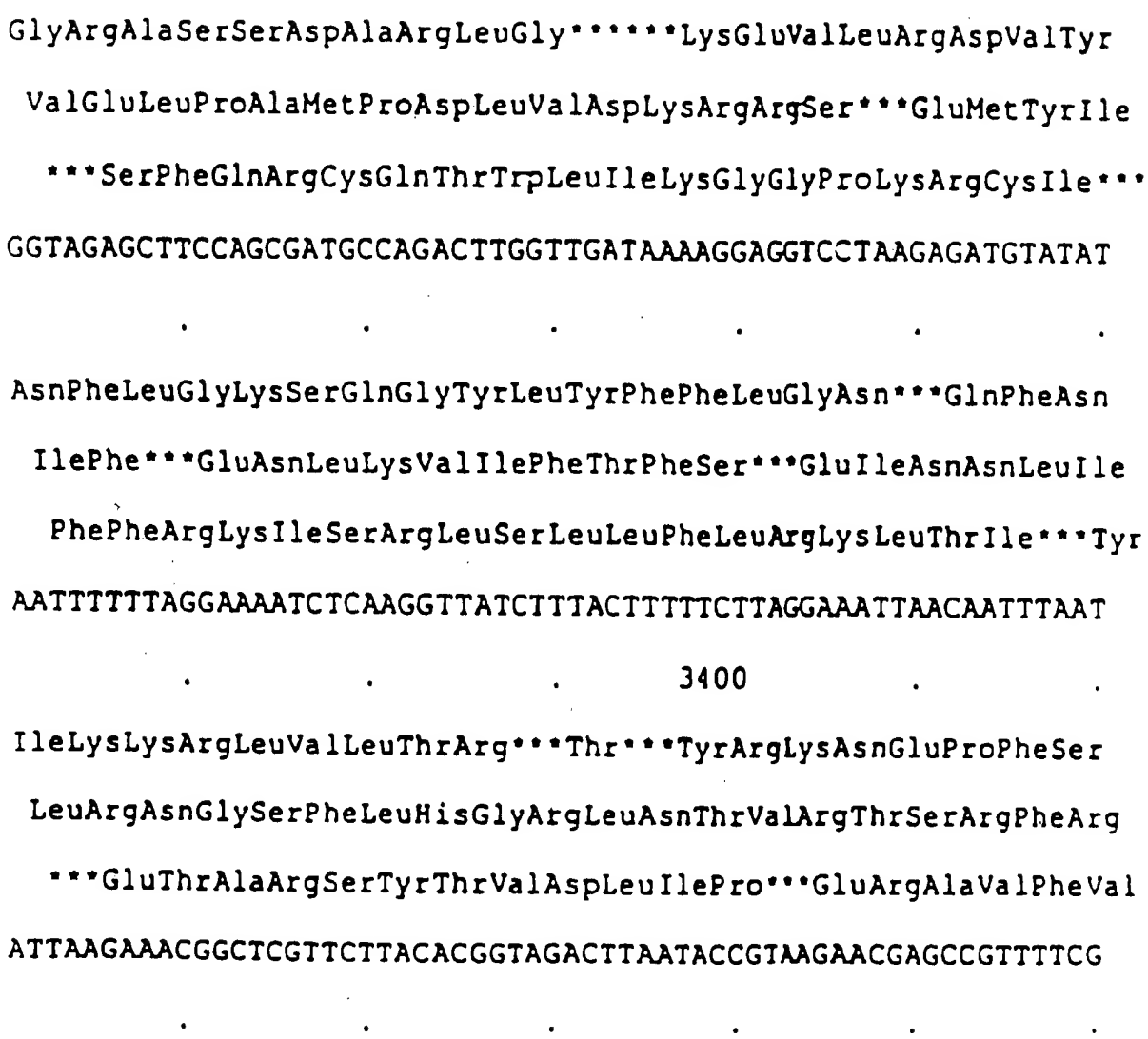
LeuPheSerMetGluGlyArgPheThrArgLysAlaMetIleThrIleArgArgLeuGly

TATTGTTCAGCATGGAGGGCAGATTTACGCGGAAAGCTATGATAACTATACGACGTTTAG

. 3300

FIG. 5V

FIG. 5W



PhePheArgGluArgPheAspLysIleThrIleGlyIleProValLeuPheGlyAlaPhe

SerSerGluLysAspLeuThrArgLeuProLeuAlaSerProPheTyrLeuValProPhe

LeuGlnArgLysIle***GlnAspTyrHisTrpHisProArgPheIleTrpCysLeuSer

TTCTTCAGAGAAAGATTTGACAAGATTACCATTGGCATCCCCGTTTTATTTGGTGCCTTT

. 3500 . . . .

HisArgLysGlyTrpSer***Leu***IleThrSerAlaLeuLeuPheMetAspValSer

ThrGluArgValGlyLeuAsnTyrGlu***HisArgHisTyrCysLeuTrpMet***Ala

GlnLysGlyLeuValLeuIleMetAsnAsnIleGlyIleThrValTyrGlyCysGluGln

CACAGAAAGGGTTGGTCTTAATTATGAATAACATCGGCATTACTGTTTATGGATGTGAGC

. 3600

FIG. 5X

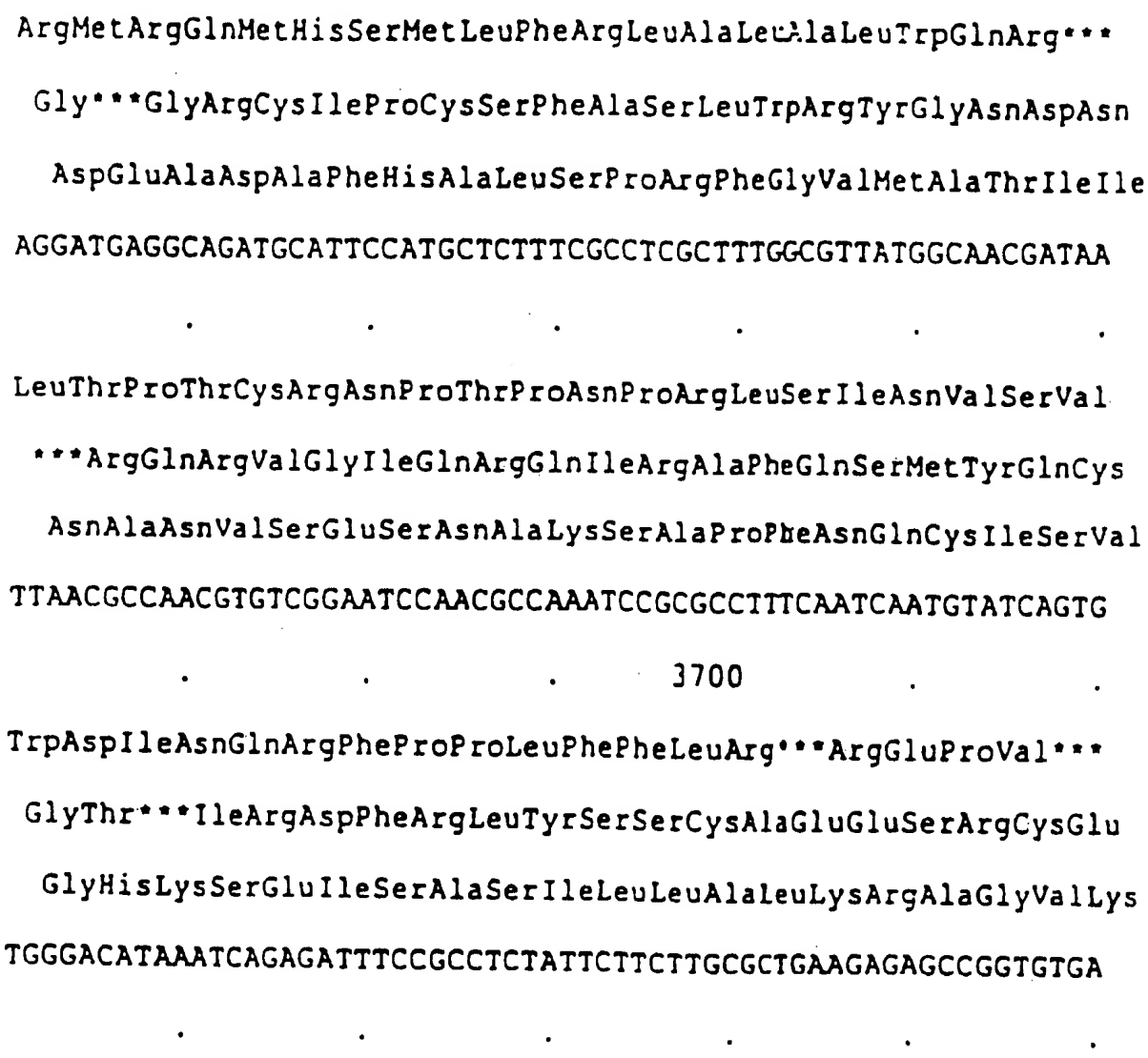


FIG. 5Y

AsnIlePheLeuProGluAlaSerAlaAlaIleIle***IleGlnLeuLeuLeuArgGlu

IleTyrPheTyrProLysHisArgLeuGlnSerTyrArgTyrAsnCysCys***GluAsn

TyrIleSerThrArgSerIleGlyCysAsnHisIleAspThrThrAlaAlaLysArgMet

AATATATTTCTACCCGAAGCATCGGCTGCAATCATATAGATACAACTGCTGCTAAGAGAA

3800

TrpAlaSerLeuSerThrMetTrpArgThrArgArgIleAlaLeuProIleIleLeu***

GlyHisHisCysArgGlnCysGlyValLeuAlaGly***ArgCysArgLeuTyrTyrAsp

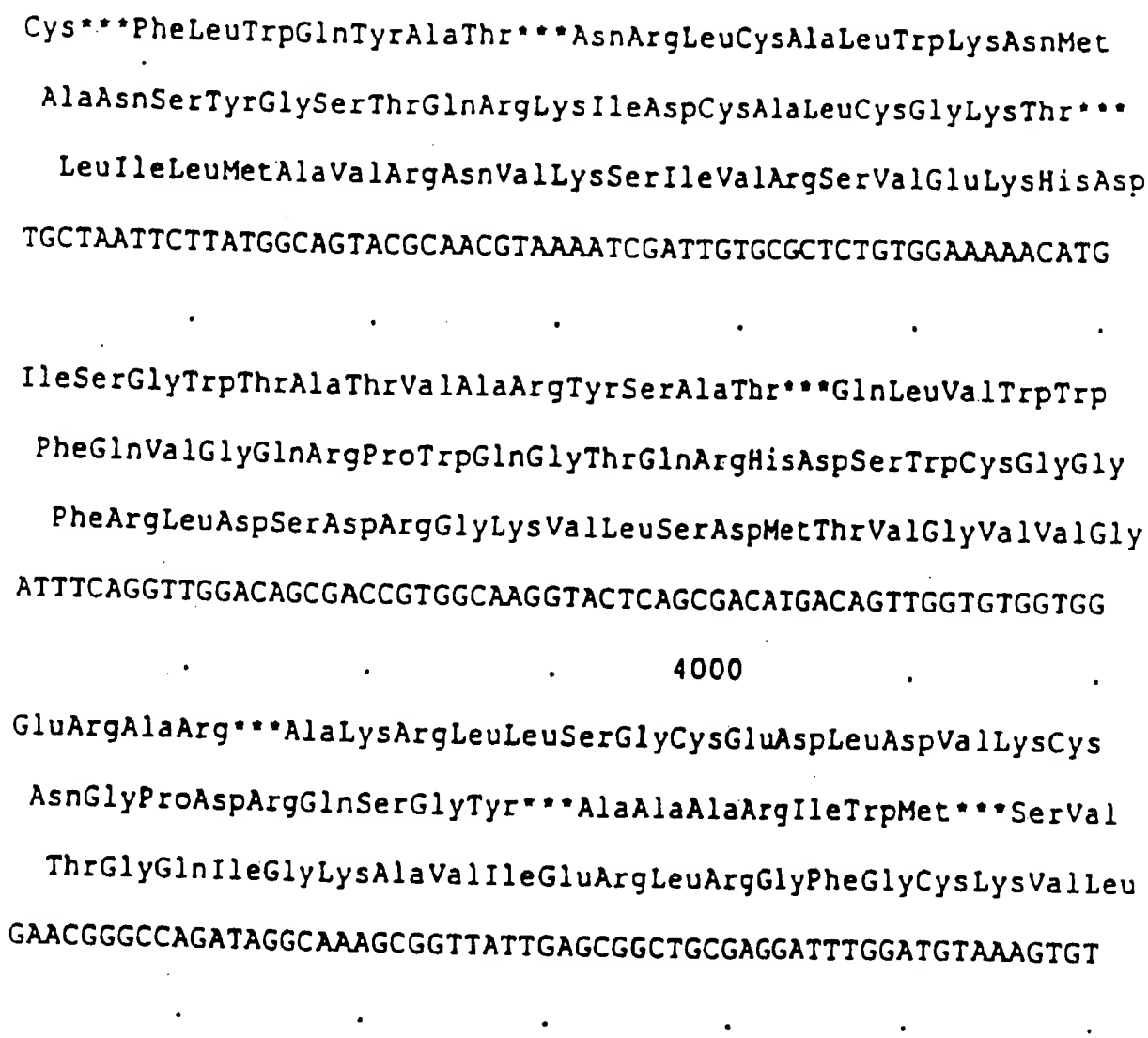
GlyIleThrValAspAsnValAlaTyrSerProAspSerValAlaAspTyrThrMetMet

TGGGCATCACTGTCGACAATGTGGCGTACTCGCCGGATAGCGTTGCCGATTATACTATGA

3900

FIG. 5Z

FIG. 5AA



TrpLeuIleValAlaAlaGluVal***Arg***ThrMetTyrArgLeuMetSerCysCys

GlyLeu***SerGlnProLysTyrArgGlyLysLeuCysThrVal******ValAlaAla

AlaTyrSerArgSerArgSerIleGluValAsnTyrValProPheAspGluLeuLeuGln

TGGCTTATAGTCGCAGCCGAAGTATAGAGGTAAACTATGTACCGTTTGATGAGTTGCTGC

. 4100 . . . .

LysIleAlaIleSerLeuArgPheMetCysArgSerIleArgIleArgThrIleLeuSer

Lys***ArgTyrArgTyrAlaSerCysAlaAlaGlnTyrGlyTyrAlaLeuTyrTyrGln

AsnSerAspIleValThrLeuHisValProLeuAsnThrAspThrHisTyrIleIleSer

AAAATAGCGATATCGTTACGCTTCATGTGCCGCTCAATACGGATACGCACTATATTATCA

. 4200

FIG. 5BB

FIG. 5CC

LeuIleIleAsnPheTyrLeuAsnPheLysGluCysLeuThr******SerHisArgIle

******SerIlePheThr***ThrSerLysAsnAla***ArgAspAsnHisThrAlaTyr

AspAsnGlnPheLeuLeuLysLeuGlnArgMetProAsnValIleIleThrProHisThr

TTGATAATCAATTTTTACTTAAACTTCAAAGAATGCCTAACGTGATAATCACACCGCATA

. 4400 . . . .

ArgProIleIleProSerLysArgCysValIleProLeuLysLysProLeuLysThrVal

GlyLeuLeuTyrArgAlaSerValAla***TyrArg***LysAsnHis***LysLeuPhe

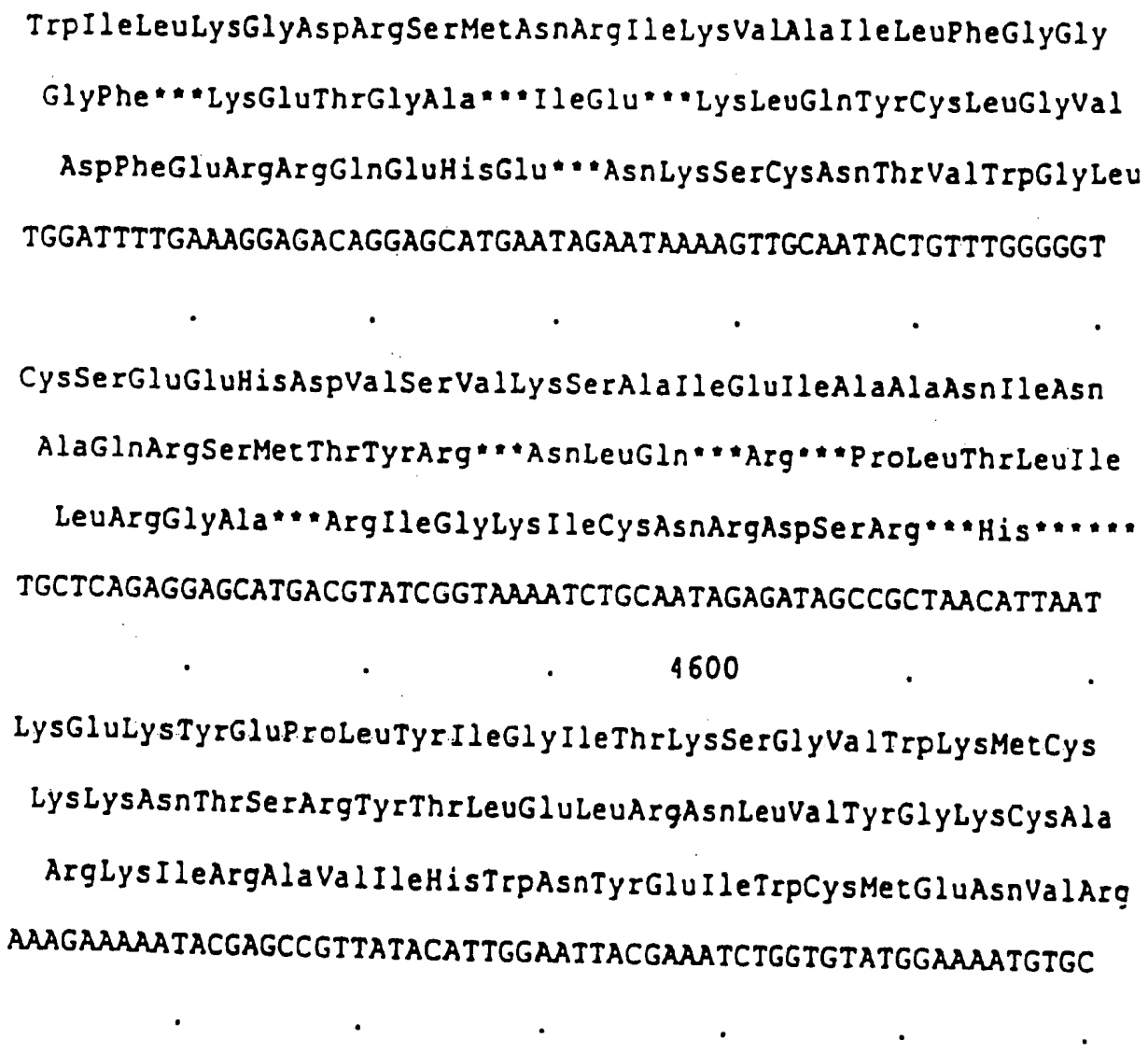
AlaTyrTyrThrGluGlnAlaLeuArgAspThrValGluLysThrIleLysAsnCysLeu

CGGCCTATTATACCGAGCAAGCGTTGCGTGATACCGTTGAAAAAACCATTAAAAACTGTT

. 4500

FIG. 5DD

FIG. 5EE



GluLysProCysAlaGluTrpGluAsnAspAsnCysTyrSerAlaValLeuSerProAsp

LysAsnLeuAlaArgAsnGlyLysThrThrIleAlaIleGlnLeuTyrSerArgArgIle

LysThrLeuArgGlyMetGlyLysArgGlnLeuLeuPheSerCysThrLeuAlaGly***

GAAAAACCTTGCGCGGAATGGGAAAACGACAATTGCTATTCAGCTGTACTCTCGCCGGAT

. 4700 . . . .

LysLysMetHisGlyLeuLeuValLysLysAsnHisGluTyrGluIleAsnHisValAsp

LysLysCysThrAspTyrLeuLeuLysArgThrMetAsnMetLysSerThrMetLeuMet

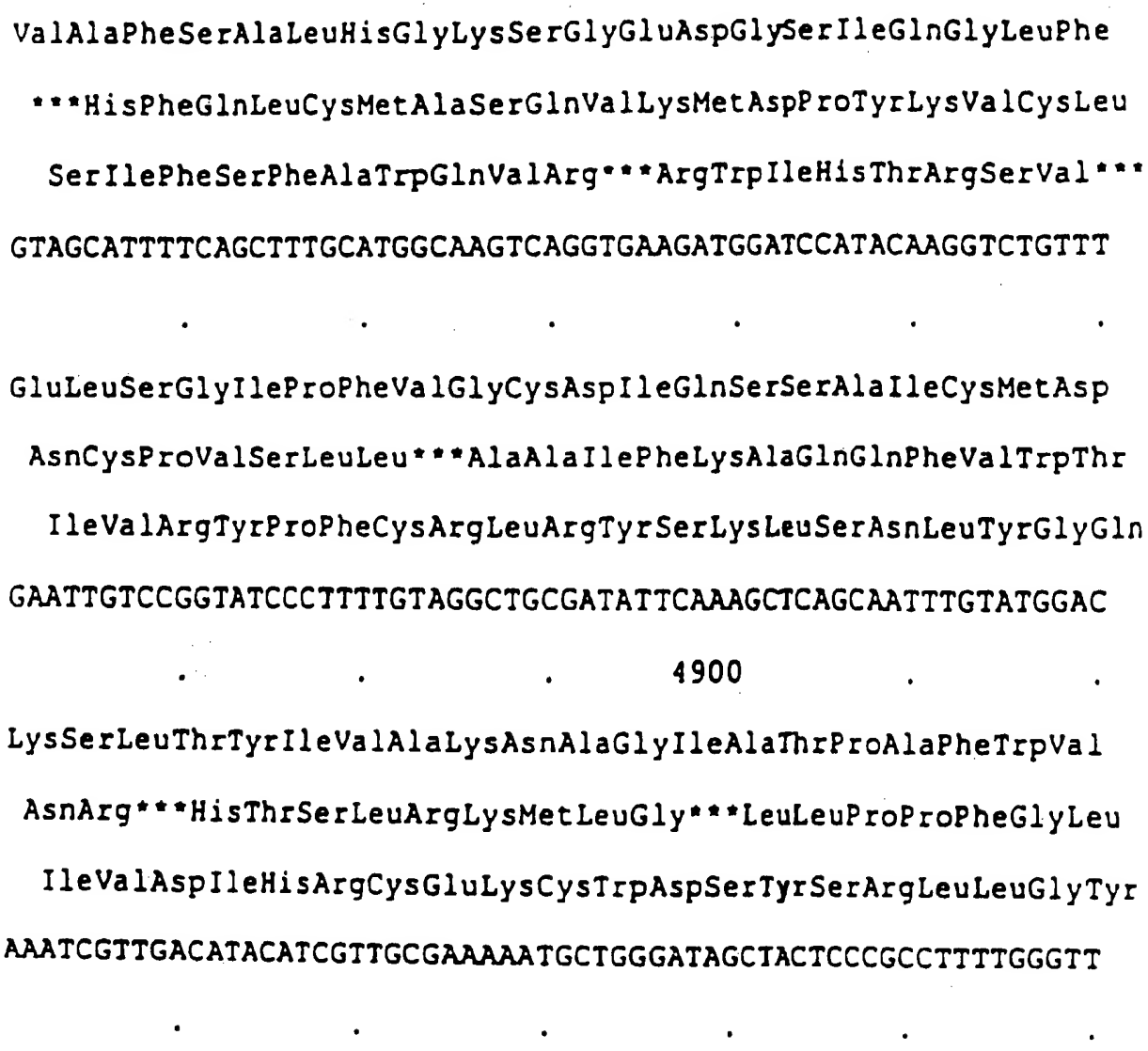
LysAsnAlaArgIleThrCys***LysGluPro***Ile***AsnGlnProCys***Cys

AAAAAAATGCACGGATTACTTGTTAAAAAGAACCATGAATATGAAATCAACCATGTTGAT

. 4800

FIG. 5FF

FIG. 5GG



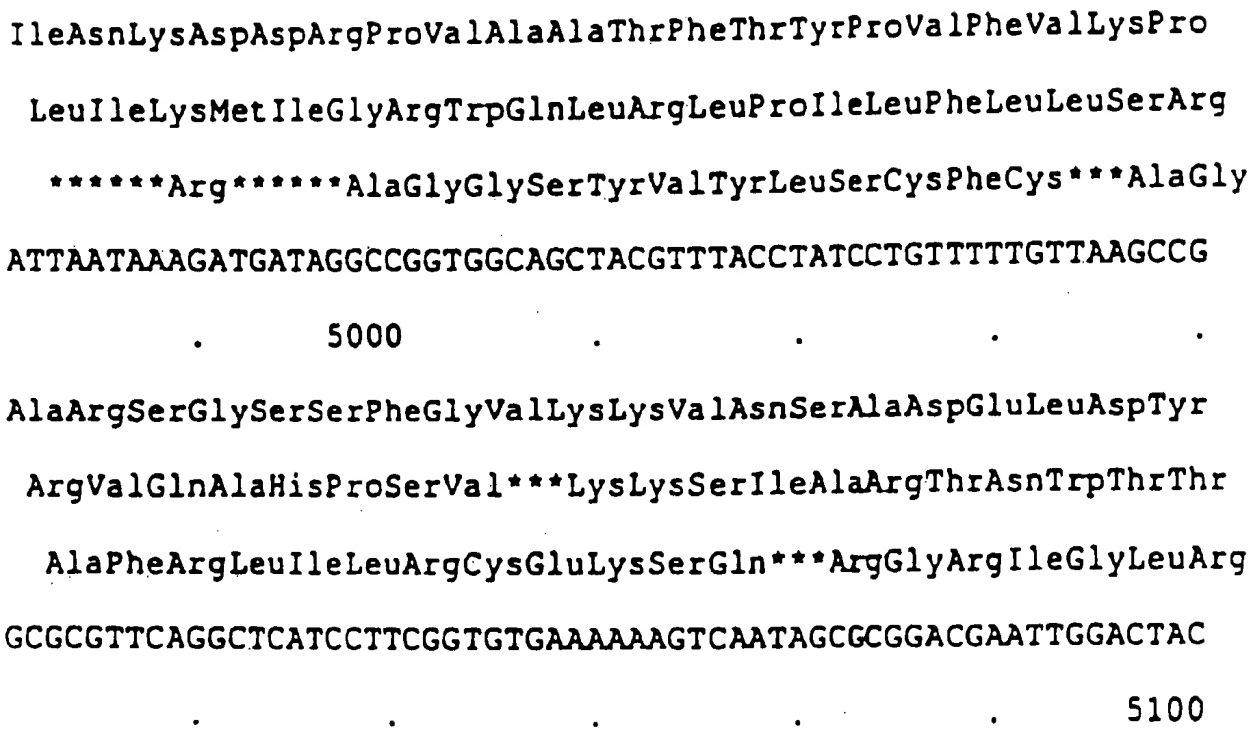


FIG. 5HH

```
AlaIleGluSerAlaArgGlnTyrAspSerLysIleLeuIleGluGlnAlaValSerGly
 GlnLeuAsnArgGlnAspAsnMetThrAlaLysSer***LeuSerArgLeuPheArgAla
  Asn***IleGlyLysThrIle***GlnGlnAsnLeuAsn***AlaGlyCysPheGlyLeu
GCAATTGAATCGGCAAGACAATATGACAGCAAAATCTTAATTGAGCAGGCTGTTTCGGGC
          .       .       .       .       .       .
CysGluValGlyCysAlaValLeuGlyAsnSerAlaAlaLeuValValGlyGluValAsp
 ValArgSerValValArgTyrTrpGluThrValProArg***LeuLeuAlaArgTrpThr
  ***GlyArgLeuCysGlyIleGlyLysGlnCysArgValSerCysTrpArgGlyGlyPro
TGTGAGGTCGGTTGTGCGGTATTGGGAAACAGTGCCGCGTTAGTTGTTGGCGAGGTGGAC
          .       .       .    5200       .       .
GlnIleArgLeuGlnTyrGlyIlePheArgIleHisGlnGluValGluProGluLysGly
 LysSerGlyCysSerThrGluSerPheValPheIleArgLysSerSerArgLysLysAla
  AsnGlnAlaAlaValArgAsnLeuSerTyrSerSerGlySerArgAlaGlyLysArgLeu
CAAATCAGGCTGCAGTACGGAATCTTTCGTATTCATCAGGAAGTCGAGCCGGAAAAAGGC
          .       .       .       .       .       .
```

FIG. 5II

SerGluAsnAlaValIleThrValProAlaAspLeuSerAlaGluGluArgGlyArgIle

LeuLysThrGlnLeu***ProPheProGlnThrPheGlnGlnArgSerGluAspGlyTyr

***LysArgSerTyrAsnArgSerArgArgProPheSerArgGlyAlaArgThrAspThr

TCTGAAAACGCAGTTATAACCGTTCCCGCAGACCTTTCAGCAGAGGAGCGAGGACGGATA

. 5300 . . . .

GlnGluThrAlaLysLysIleTyrLysAlaLeuGlyCysArgGlyLeuAlaArgValAsp

ArgLysArgGlnLysLysTyrIleLysArgSerAlaValGluVal***ProValTrpIle

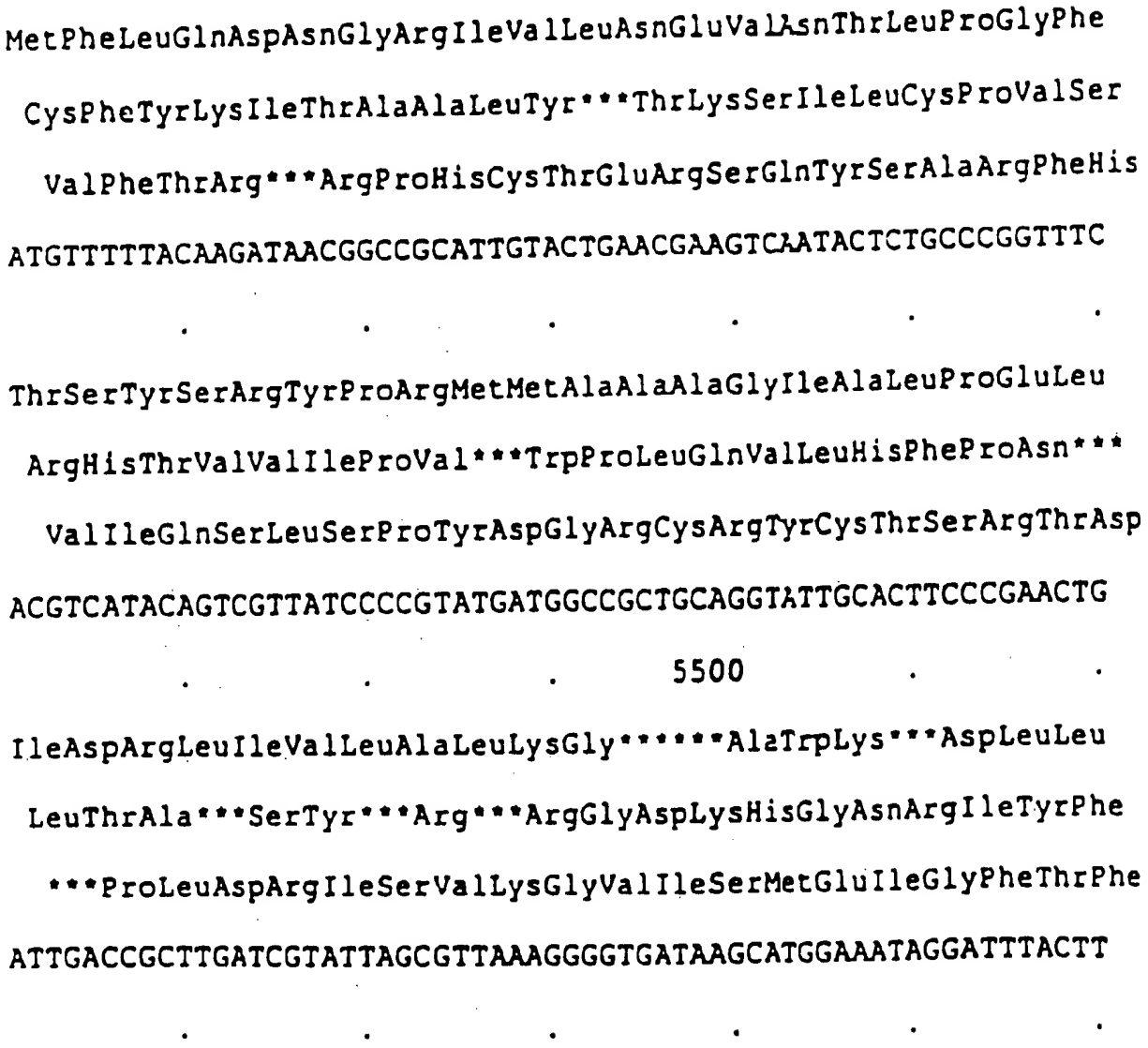
GlyAsnGlyLysLysAsnIle***SerAlaArgLeu***ArgSerSerProCysGlyTyr

CAGGAAACGGCAAAAAAAATATATAAAGCGCTCGGCTGTAGAGGTCTAGCCCGTGTGGAT

. 5400

FIG. 5JJ

FIG. 5KK



Phe***MetLys***TyrThrValPheValGlyThrLeuAsnMetProLeuGlyIleIle

PheArg***AsnSerThrArgCysSerLeuGlyArg***IleCysHisLeuGly***Phe

LeuAspGluIleValHisGlyValArgTrpAspAlaLysTyrAlaThrTrpAspAsnPhe

TTTTAGATGAAATAGTACACGGTGTTCGTTGGGACGCTAAATATGCCACTTGGGATAATT

5600

SerProGluAsnArgLeuThrValMetLys***IleAlaLeu***GlyHisThrSerTrp

HisArgLysThrGly***ArgLeu***SerLysSerHisCysArgAspIleArgValGly

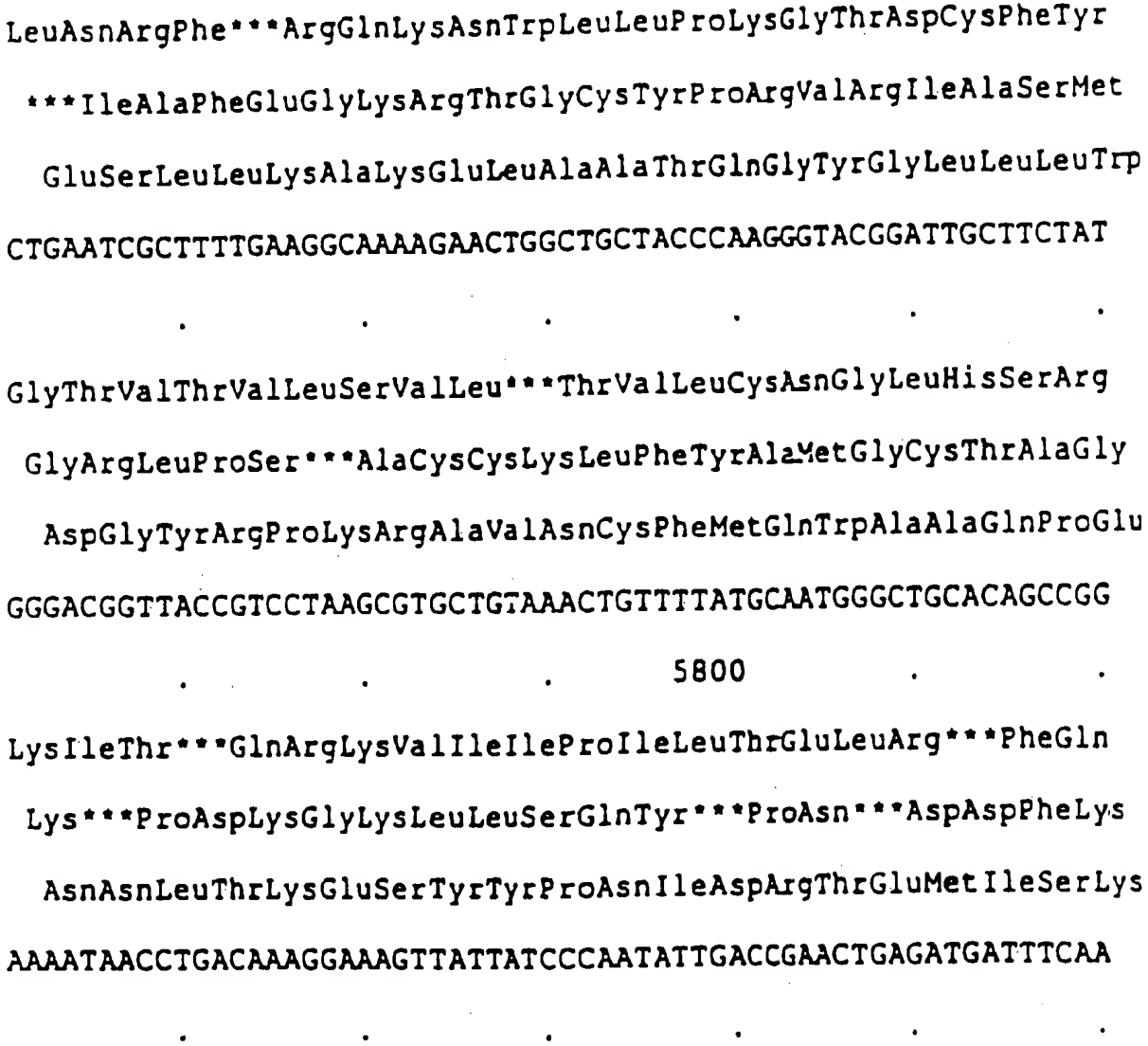
ThrGlyLysProValAspGlyTyrGluValAsnArgIleValGlyThrTyrGluLeuAla

TCACCGGAAAACCGGTTGACGGTTATGAAGTAAATCGCATTGTAGGGACATACGAGTTGG

5700

FIG. 5LL

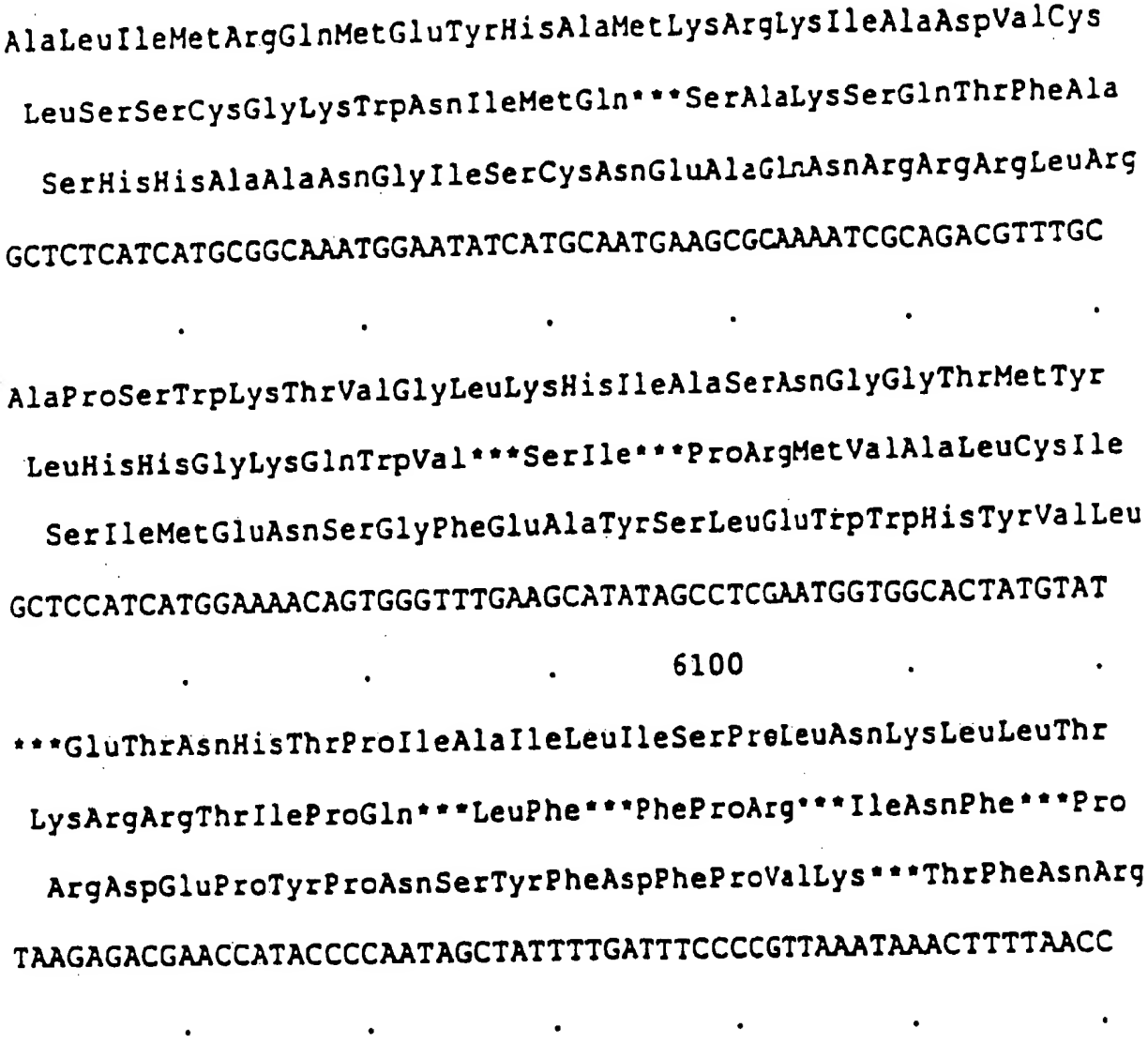
FIG. 5MM



```
LysAspThrTrpLeuGlnAsnGlnAlaIleAlaAlaAlaValProLeuIleLeuArgPhe
 ArgIleArgGlyPheLysIleLysPro***ProArgGlnCysHis***SerTyrAlaLeu
  GlyTyrValAlaSerLysSerSerHisSerArgGlySerAlaIleAspLeuThrLeuTyr
AAGGATACGTGGCTTCAAAATCAAGCCATAGCCGCGGCAGTGCCATTGATCTTACGCTTT
          .      5900        .       .       .       .
IleAsp***ThrArgValSerLeuTyrGlnTrpGlyAlaAspLeuIleLeuTrpMetAsn
 SerIleArgHisGly***AlaCysThrAsnGlyGluProIle***PheTyrGly***Thr
  ArgLeuAspThrGlyGluLeuValProMetGlySerArgPheAspPheMetAspGluArg
ATCGATTAGACACGGGTGAGCTTGTACCAATGGGGAGCCGATTTGATTTTATGGATGAAC
          .       .       .       .       .      6000
```

FIG. 5NN

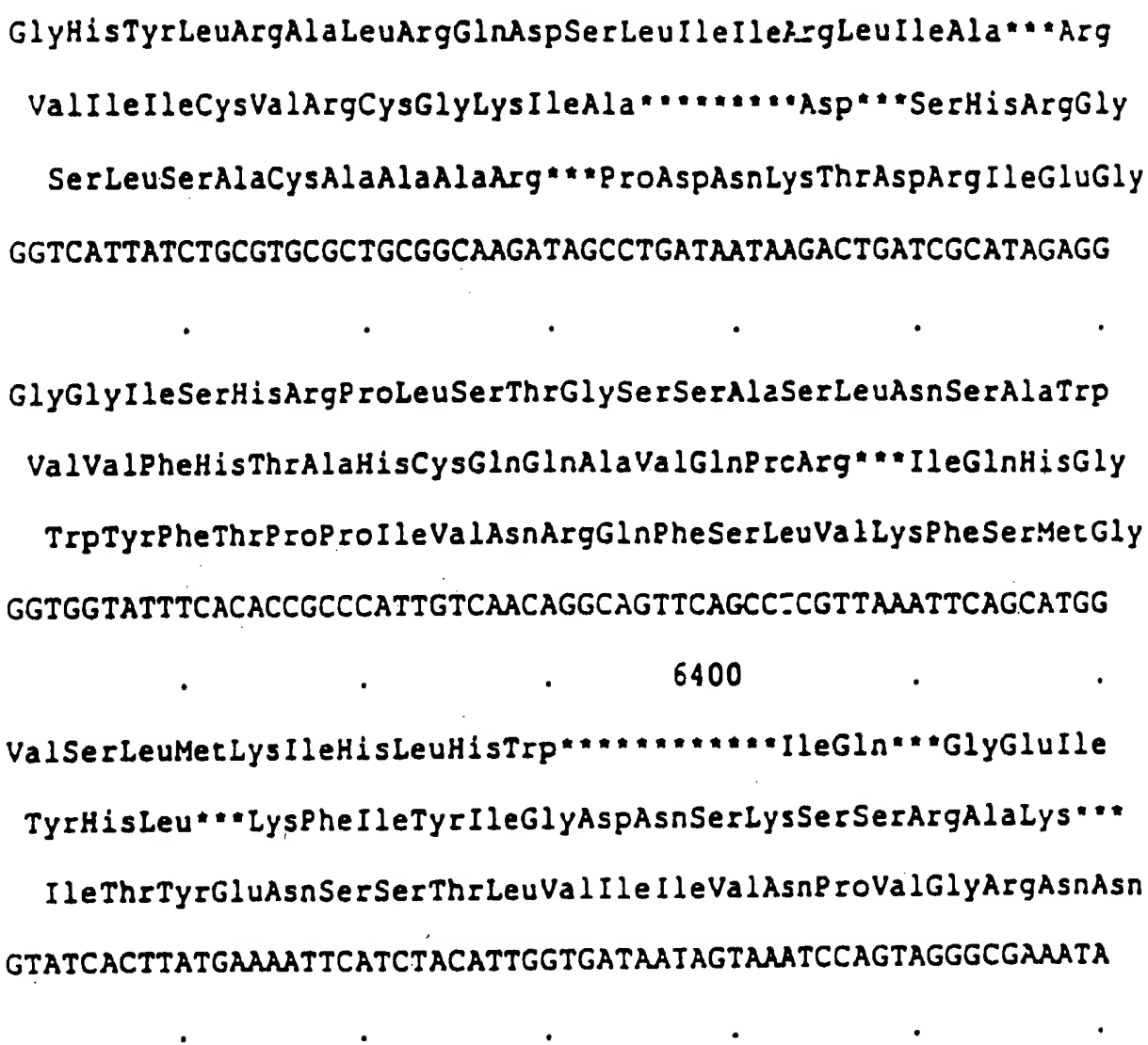
FIG. 500



```
ValAlaArgThrAsnTyrIleSer***LeuPheArgGlnGluThrArgArgMet***Leu
 LeuHisGlyGlnThrIle***AlaAsnSerPheGlyArgLysProAspValCysAsnTrp
  CysThrAspLysLeuTyrLysLeuThrLeuSerAlaGlyAsnProThrTyrValThrGly
GTTGCACGGACAAACTATATAAGCTAACTCTTTCGGCAGGAAACCCGACGTATGTAACTG
          .      6200        .         .         .         .
ValLeuArgGluPheIleTyrSerArg***Tyr***ArgCysLysAlaGluArgTyrCys
 PheLeuGlyAsnLeuTyrIleValAspSerIleGluAspValArgGlnSerAspIleAla
  Ser***GlyIleTyrIle******IleValLeuLysMet***GlyArgAlaIleLeuArg
GTTCTTAGGGAATTTATATATAGTAGATAGTATTGAAGATGTAAGGCAGAGCGATATTGC
          .         .         .         .         .      6300
```

FIG. 5PP

FIG. 5QQ



IleAspCysAsnLeuArgGlyLysThrAlaGlnSerGlnThrArgLeuCysArgLeuArg

LeuThrValIleTyrGlyAlaLysArgHisAsnLeuLysArgAspCysAlaVal***Gly

LeuPheThrGlyGlnAsnGlyThrIleSerAsnGluIleValProPheLysGly

ATTGACTGTAATTTACGGGGCAAAACGGCACAATCTCAAACGAGATTGTGCCGTTTAAGG

. 6500 . . . .

GlyArgPhe***LysTyrPheIleLeuProThrIle***LeuArgArgArgLeuLysMet

GluAspSerArgAsnIleSerTyrPheGlnLeuTyrSer***GlyGlyAsp***Lys***

LysIleLeuGluIlePheHisThrSerAsnTyrIleValLysGluGluThrGluAsnGlu

GGAAGATTCTAGAAATATTTCATACTTCCAACTATATAGTTAAGGAGGAGACTGAAAATG

. 6600

FIG. 5RR

FIG.5SS

```
GlnValTyrGlnGlyAsnLeuLeuLeuIleAsnSerLysTyrProValArgGlnGluVal

 ArgPheIleLysGluIleCysTyr***SerIleValAsnIleLeuPheAlaLysLysCys

  GlyLeuSerArgLysSerAlaIleAsnGln******IleSerCysSerProArgSerVal

CAGGTTTATCAAGGAAATCTGCTATTAATCAATAGTAAATATCCTGTTCGCCAAGAAGTG

          .      6800          .          .          .          .

***SerGlnIleSer***IleTyrLeuAsnMetThrAsn******MetAspThrGlyCys

 GluValArgTyrArgGluPheIle***Thr***ArgIleAsnLysTrpIleArgValAla

  LysSerAspIleValAsnLeuSerLysHisAspGluLeuIleAsnGlyTyrGlyLeuLeu

TGAAGTCAGATATCGTGAATTTATCTAAACATGACGAATTAATAAATGGATACGGGTTGC

                                                          6900
```

FIG. 5TT

```
LeuIleValIlePheIleCysGlnLysLys***HisLysAsnPheGlnArgTrpSerMet
 *********TyrLeuTyrValLysArgAsnSerThrLysIlePheArgAspGlyGln***
  AspSerAsnIleTyrMetSerLysGluIleAlaGlnLysPheSerGluMetValAsnAsp
TTGATAGTAATATTTATATGTCAAAAGAAATAGCACAAAAATTTTCAGAGATGGTCAATG
         .       .       .       .       .       .
MetLeu***ArgValAlaLeuValIleLeuLeuLeuIleValAlaIleGluThrLeuMet
 CysCysLysGlyTrpArg***SerPheTyrTyr******TrpLeuSerArgLeu******
  AlaValLysGlyGlyValSerHisPheIleIleAsnSerGlyTyrArgAspPheAspGlu
ATGCTGTAAAGGGTGGCGTTAGTCATTTTATTATTAATAGTGGCTATCGAGACTTTGATG
         .       .       .    7000       .       .
SerLysValCysPheThrLysLysTrpGlyLeuSerMetPrcTyrGlnGlnValIleVal
 AlaLysCysAlaLeuProArgAsnGlyGly***ValCysLeuThrSerArgLeu******
  GlnSerValLeuTyrGlnGluMetGlyAlaGluTyrAlaLeuProAlaGlyTyrSerGlu
AGCAAAGTGTGCTTTACCAAGAAATGGGGGCTGAGTATGCCTTACCAGCAGGTTATAGTG
         .       .       .       .       .       .
```

FIG. 5UU

SerIleIleGlnValTyrHis***Met***AspGlnAla***ArgLysTrpAsnGluPro

Ala***PheArgPheIleThrArgCysArgIleLysLeuAspGluAsnGlyThrSerPro

HisAsnSerGlyLeuSerLeuAspValGlySerSerLeuThrLysMetGluArgAlaPro

AGCATAATTCAGGTTTATCACTAGATGTAGGATCAAGCTTGACGAAAATGGAACGAGCCC

. 7100 . . . .

LeuLysGluSerGly***LysLysMetLeuGlyAsnThrGlySerPheTyrValIleGln

***ArgLysValAspArgArgLysCysLeuGluIleArgValHisPheThrLeuSerArg

GluGlyLysTrpIleGluGluAsnAlaTrpLysTyrGlyPheIleLeuArgTyrProGlu

CTGAAGGAAAGTGGATAGAAGAAAATGCTTGGAAATACGGGTTCATTTTACGTTATCCAG

. 7200

FIG. 5VV

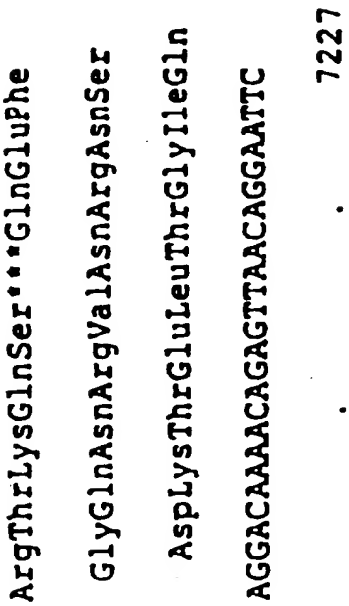
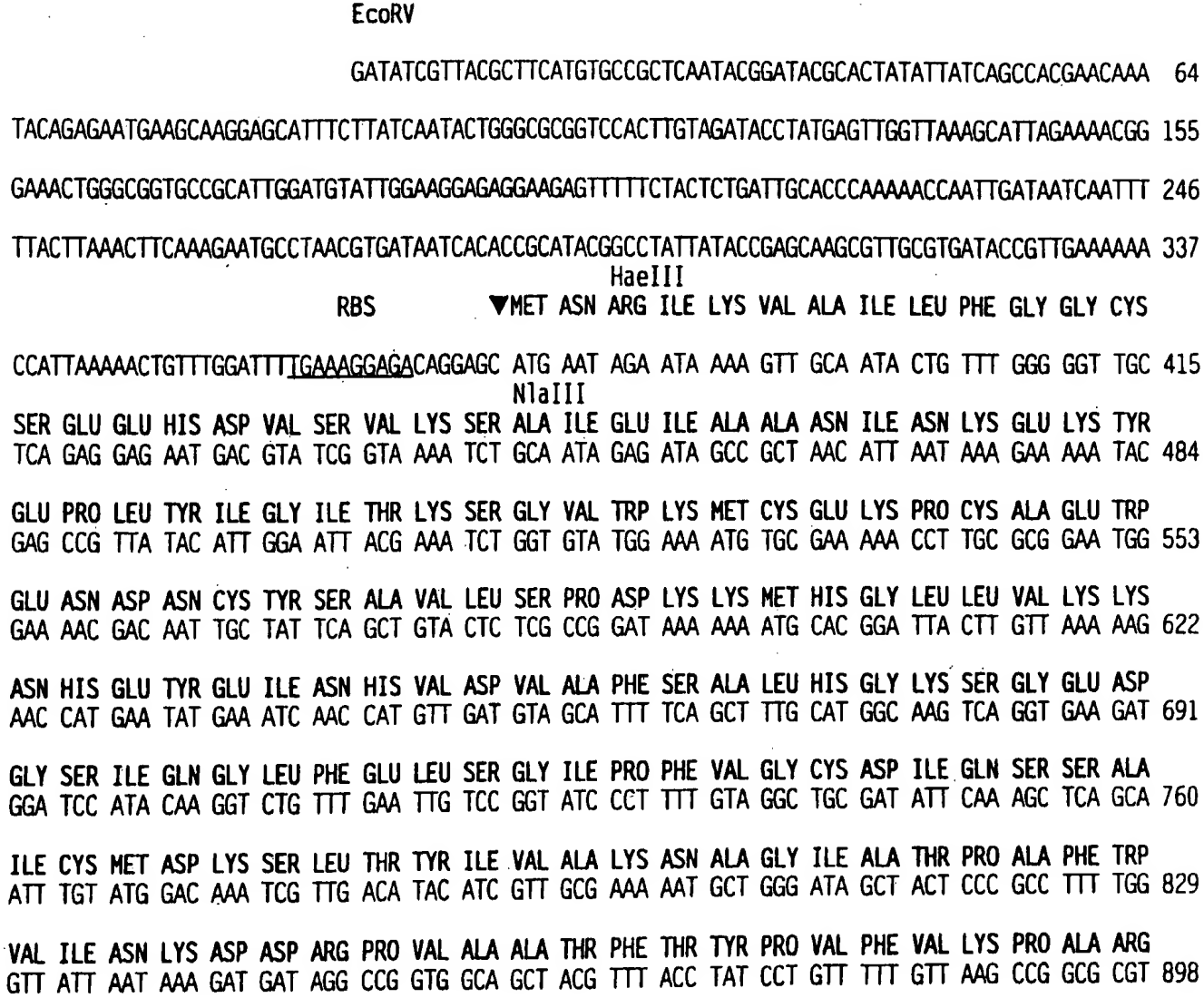

ArgThrLysGlnSer***GlnGluPhe
GlyGlnAsnArgValAsnArgAsnSer
AspLysThrGluLeuThrGlyIleGln
AGGACAAACAGAGTTAACAGGAATTC
7227

FIG. 5WW

FIG. 6A



```
SER GLY SER SER PHE GLY VAL LYS LYS VAL ASN SER ALA ASP CLU LEU ASP TYR ALA ILE GLU SER ALA
TCA GGC TCA TCC TTC GGT GTG AAA AAA GTC AAT AGC GCG GAC GAA TTG GAC TAC GCA ATT GAA TCG GCA  967

ARG GLN TYR ASP SER LYS ILE LEU ILE GLU GLN ALA VAL SER GLY CYS GLU VAL GLY CYS ALA VAL LEU
AGA CAA TAT GAC AGC AAA ATC TTA ATT GAG CAG GCT GTT TCG GGC TGT GAG GTC GGT TGT GCG GTA TTG 1036

GLY ASN SER ALA ALA LEU VAL VAL GLY GLU VAL ASP GLN ILE ARG LEU GLN TYR GLY ILE PHE ARG ILE
GGA AAC AGT GCC GCG TTA GTT GTT GGC GAG GTG GAC CAA ATC AGG CTG CAG TAC GGA ATC TTT CGT ATT 1105

HIS GLN GLU VAL GLU PRO GLU LYS GLY SER GLU ASN ALA VAL ILE THR VAL PRO ALA ASP LEU SER ALA
CAT CAG GAA GTC GAG CCG GAA AAA GGC TCT GAA AAC GCA GTT ATA ACC GTT CCC GCA GAC CTT TCA GCA 1174

GLU GLU ARG GLY ARG ILL GLN GLU THR ALA LYS LYS ILE TYR LYS ALA LEU GLY CYS ARG GLY LEU ALA
GAG GAG CGA GGA CGG ATA CAG GAA ACG GCA AAA AAA ATA TAT AAA GCG CTC GGC TGT AGA GGT CTA GCC 1243

ARG VAL ASP MET PHL LEU GLN ASP ASN GLY ARG ILE VAL LEU ASN GLU VAL ASN THR LEU PRO GLY PHE
CGT GTG GAT ATG TTT TTA CAA GAT AAC GGC CGC ATT GTA CTG AAC GAA GTC AAT ACT CTG CCC GGT TTC 1312

THR SER TYR SER ARG TYR PRO ARG MET MET ALA ALA ALA GLY ILE ALA LEU PRO GLU LEU ILE ASP ARG
ACG TCA TAC AGT CGT TAT CCC CGT ATG ATG GCC GCT GCA GGT ATT GCA CTT CCC GAA CTG ATT GAC CGC 1381

LEU ILE VAL LEU ALA LEU LYS GLY *** ***
TTG ATC GTA TTA GCG TTA AAG GGG TGA TAA GCATGGAAATAGGATTTACTTTTTTAGATGAAATAGTACACGGTGTTCGTT 1462
                                  ▲        NlaIII
GGGACGCTAAATATGCCACTTGGGATAATTTCACCGGAAAACCGGTTGACGGTTATGAAGTAAATCGCATTGTAGGGACATACGAGTTGGC 1553
TGAATCGCTTTTGAAGGCAAAAGAACTGGCTGCTACCCAAGGGTACGGATTGCTTCTATGGGACGGTTACCGTCCTAAGCGTGCTGTAAAC 1644
TGTTTTATGCAATGGGCTGCACAGCCGGAAAATAACCTGACAAAGGAAAGTTATTATCCCAATATTGACCGAACTGAGATGATTTCAAAAG 1735
                                  sacII
GGATACGTGGcTTCAAAATCAAGCCATAGCCGCG                                                          1769
```

FIG. 6B

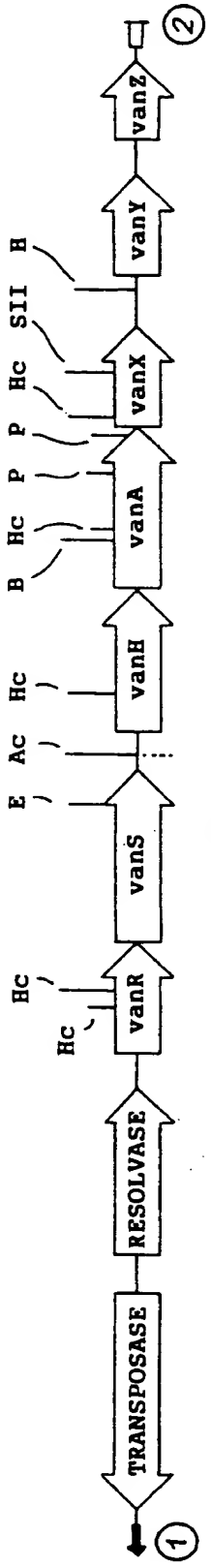

TRANSPOSASE
RESOLVASE
vanR
vanS
vanH
vanA
vanX
vanY
vanZ
Hc
Hc
Hc
E
Ac
Hc
B
Hc
P
P
Hc
SII
H
1
2

FIG. 7A

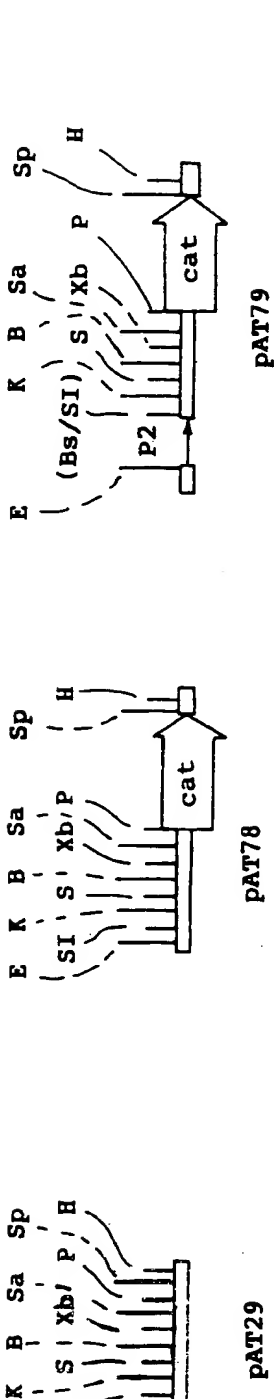


FIG. 7B

FIG. 7C

FIG. 7D

Ia. brin "+"

```
1
GGG GTA GCG TCA GGA AAA TGC GGA TTT ACA ACG CTA AGC CTA TTT TCC TGA CGA ATC CCT
61
CGT TTT TAA CAA CGT TAA GAA AGT TTT AGT GGT CTT AAA GAA TTT AAT GAG ACT ACT TTC
121
TCT GAG TTA AAA TGG TAT TCT CCT AGT AAA TTA ATA TGT TCC CAA CCT AAG GGC GAC ATA
181
TGG TGT AAC AAA TCT TCA TTA AAG CTA CCT GTC CGT TTT TTA TAT TCA ACT GCT GTT GTT
241
AGG TGG AGA GTA TTC CAA ATA CTT ATA GCA TTG ATA ATT ATG TTT AAA GCA CTG GCT CTT
301
TGC AAT TGA TGC TGT ATG GTG CGT TCT CTA AGC TCA CCT TGT TTT CCG AAG AAA ATA GCT
361
CTT GCC AAT CCA TTC ATG GCT TCT CCT TTA TTC AAT CCT CTT TGT ATT TTT CTT CTT AAT
421
GAT TCA TCC GAT ATA TAA TTC AAA ATA AAG ATC GTT TTT TCT ATT CGG CCC ATC TCA CGT
481
AAG GCT GTA GCT AAG CTG TTT TGT CTT GAA TAG GAA CCT AGC TTC CCC ATA ATA AGG GAT
541
GCT GAA ACT GTT CCC TCC CTT ATA GAA TGA GCT AAT CGC AAA ACA TCC TCA TAA TTT TCT
601
TTA ATG ACC TTT GTA TTT ATT TGT CCA CGT AAA ATG GCT TCT AGT TTT GGA TAC TCA CTT
```

FIG. 8A

661
GCT TTA TCT ATC GTA AAT AAT TTT GAG TCC GAT AAA TCC CTT ATT CTT GGG GCA AAT TTA
721
AAT CCT AAT AAA TGA GTC AGT CCG AAT ATT TGG TCA GTG TAA CCG GCA GTG TCT GTA TAA
781
TGT TCC TCT ATG TTT AGA TCC GTC TCA TGA TGT AAC AAA CCA TCC AAA ACA TGA ATC GCA
841
TCT CTT GAA TTA GTA TGA ATA ATC TTT GTG TAG TAA GAA GAG AAT TGA TCA CTT GTA AAT
901
CGG TAG ATG GTG GCT CCT TTT CCA GTT CCA TAA TGT GGA TTT GCA TCT GCA TGT AGT GAT
961
GAA ACA CCT AGC TGC ATT CTC ATA CCA TCT GAC GAA GAT GTT GTA CCG TCG CCC CAA TAG
1021
AAA GGC AAT TGT AAT TTA TGA TGA AAG TTT ACT AAT ATG GCT TGG GCT TTA TTC ATG GCA
1081
TCT TCA TAC ATG CGC CAT TGA GAT ACA TTG GCT AGT TGC TTA TAT GTA AGT CCG GGT GTG
1141
GCT TCG GCC ATC TTG CTC AAG CCA ATA TTC ATT CCC ATT CCT AAA AGG GCA GCC ATG ATA
1201
ATG ATT GTT TCT TCC TTA TCT GGT TTT CGA TTA TTG GAA GCA TGA GTG AAT TGC TCA TGA
1261
AAT CCT GTT ATA TGG GCC ACA TCC ATG AGT AAA TCA GTT AAT TTT ATT CTT GGT AGC ATC
1321
TGA TAA AGG CTT GCA CTA AAT TTT TTT GCT TCT TCT GGA ACA TCT TTT TCT AAG CGT GCA
1381
AGT GAT AGC TTT CCT TTT TCA AGA GAA ACC CCA TCT AAC TTA TTG GAA TTG GCA GCT AAC
1441
CAC TTT AAC CTT TCA TTA AAG CTG CTG GTT CTC TCC GTT ATA TAA TCT TCG AAT GAT AAA

FIG. 8B

1501
CTA ACT GAT AAT CTC GTA TTC CCC TTC GAT TGA TTC CAT GTA TCT TCC GAA AAC AAA TAT
1561
TCC TCA AAA TCC CTA TAT TGT CTG CTG CCA ACA ATG GAA ACA TCT CCT GCC CGA ACA TGC
1621
TCC CGA AGT TCT GTT AAA ACA GCC ATT TCA TAG TAA TGA CGA TTA ATT GTT GTA CCA TCA
1681
TCC TCG TAT AAA TGT CTT TTC CAT CGT TTT GAA ATA AAA TCC ACA GGT GAG TCA TCA GGC
1741
ACT TTT CGC TTT CCA GAT TCG TTC ATT CCT CGG ATA ATC TCA ACA GCT TGT AAA AGT GGC
1801
TCA TTT GCC TTT GTA GAA TGA AAT TCC AAT ACT CTT AAT AGC GTT GGC GTA TAT TTT CTT
1861
AGT GAA TAA AAC CGT TTT TGC AGT AAG TCT AAA TAA TCA TAG TCG GCA GGA CGT GCA AGT
1921
TCC TGA GCC TCT TCT ACT GAA GAG ACA AAG GTA TTC CAT TCA ATA ACC GAT TCT AAA ACC
1981
TTA AAA ACG TCT AAT TTT TCC TCT CTT GCT TTA ATT AAT GCT TGT CCG ATG TTC GTA AAG
2041
TGT ATA ACT TTC TCA TTT AGC TTT TTA CCG TTT TGT TTC TGG ATT TCC TCT TGA GCC TTA
2101
CGA CCT TTT GAT AAC AAA CTA AGT ATT TGC CTA TCA TGA ATT TCA AAC GCT TTA TCC GTT
2161
AGC TCC TGA GTA AGT TGT AAT AAA TAG ATG GTT AAT ATC GAA TAA CGT TTA TTT TCT TGA
2221
AAG TCA CGG AAT GCA TAC GGC TCG TAT CTT GAG CCT AAG CGA GAC AGC TGC AAC AGG CGG
2281
TTA CGG TGC AAA TGA CTA ATT TGC ACT GTT TCT AAA TCC ATT CCT CGT ATG TAT TCG AGT
2341

FIG. 8C

FIG. 8D

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CGT TCT ATT ATT TTT AGA AAA GTT TCG GGT GAA GGA TGA CCC GGT GGC TCT TTT AAC CAA
2401
CCC AAT ATC GTT TTA TTG GAT TCG GAT GGA TGC TGC GAG GTA ATA ATC CCT TCA AGC TTT
2461
TCT TTT TGC TCA TTT GTT AGA GAT TTA CTA ACC GTA TTA AAT AGC TTC TTT TCA GCC ATT
2521
GCC CTT GCT TCC CAC ACC ATT CTT TCA AGT GTA GTG ATA GCA GGC AGT ATA ATT TTG TTT
2581
TTT CTT AGA AAA TCT ATG CAT TCA TGC AGT AGA TGA ATG GCA TCA CCA TTT TCC AAA GCT
2641
AAT TGA TGA AGG TAC TTA AAT GTC ATT CGA TAT TCA CTC AGG GTA AAA GTT ACA AAG TCG
2701
TAT TCA CTT CGA ATT TCT TTC AAA TGA TCC CAA AGT GTA TTT TCC CTT TGA GGA TAA TGA
2761
TCA AGC GAG GAT GGA CTA ACA CCA ATC TGT TTC GAT ATA TAT TGT ATG ACC GAA TCT GGG
2821
ATG CTT TTG ATA TGA GTG TAT GGC CAA CCG GGA TAC CGA AGA ACA GCT AAT TGA ACA GCA
2881
AAT CCT AAA CGG TTT TCT TCC CTC CTT CGC TTA TTA ACT ATT TCT AAA TCC CGT TTG GAA
2941
AAA GTG AAG TAG GTC CCC AGT ATC CAT TCA TCT TCA GGG ATT TGC ATA AAA GCC TGT CTC
3001
TGT TCC GGT GTA AGC AAT TCT CTA CCT CTC GCA ATT TTC ATT CAG TAT CAT TCC ATT TCT
3061
GTA TTT TCA ATT TAT TAG TTC AAT TAT ATA TCA ATA GAG TGT ACT CTA TTG ATA CAA ATG
3121
TAG TAG ACT GAT AAA ATC ATA GTT AAG AGC GTC TCA TAA GAC TTG TCT CAA AAA TGA GGT
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3181     resolvase
         LEU ARG LYS ILE GLY TYR ILE ARG VAL SER SER THR ASN GLN ASN PRO SER ARG
GAT ATT TTG CGG AAA ATC GGT TAT ATT CGT GTC AGT TCG ACT AAC CAG AAT CCT TCA AGA
3241
GLN PHE GLN GLN LEU ASN GLU ILE GLY MET ASP ILE ILE TYR GLU GLU LYS VAL SER GLY
CAA TTT CAG CAG TTG AAC GAG ATC GGA ATG GAT ATT ATA TAT GAA GAG AAA GTT TCA GGA
3301
ALA THR LYS ASP ARG GLU GLN LEU GLN LYS VAL LEU ASP ASP LEU GLN GLU ASP ASP ILE
GCA ACA AAG GAT CGC GAG CAA CTT CAA AAA GTG TTA GAC GAT TTA CAG GAA GAT GAC ATC
3361
ILE TYR VAL THR ASP LEU THR ARG ILE THR ARG SER THR GLN ASP LEU PHE GLU LEU ILE
ATT TAT GTT ACA GAC TTA ACT CGA ATC ACT CGT AGT ACA CAA GAT CTA TTT GAA TTA ATC
3421
ASP ASN ILE ARG ASP LYS LYS ALA SER LEU LYS SER LEU LYS ASP THR TRP LEU ASP LEU
GAT AAC ATA CGA GAT AAA AAG GCA AGT TTA AAA TCA CTA AAA GAT ACA TGG CTT GAT TTA
3481
SER GLU ASP ASN PRO TYR SER GLN PHE LEU ILE THR VAL MET ALA GLY VAL ASN GLN LEU
TCA GAA GAT AAT CCA TAC AGC CAA TTC TTA ATT ACT GTA ATG GCT GGT GTT AAC CAA TTA
3541
GLU ARG ASP LEU ILE ARG MET ARG GLN ARG GLU GLY ILE GLU LEU ALA LYS LYS GLU GLY
GAG CGA GAT CTT ATT CGG ATG AGA CAA CGT GAA GGG ATT GAA TTG GCT AAG AAA GAA GGA
3601
LYS PHE LYS GLY ARG LEU LYS LYS TYR HIS LYS ASN HIS ALA GLY MET ASN TYR ALA VAL
AAG TTT AAA GGT CGA TTA AAG AAG TAT CAT AAA AAT CAC GCA GGA ATG AAT TAT GCG GTA
3661
LYS LEU TYR LYS GLU GLY ASN MET THR VAL ASN GLN ILE CYS GLU ILE THR ASN VAL SER
AAG CTA TAT AAA GAA GGA AAT ATG ACT GTA AAT CAA ATT TGT GAA ATT ACT AAT GTA TCT
3721
ARG ALA SER LEU TYR ARG LYS LEU SER GLU VAL ASN ASN
AGG GCT TCA TTA TAC AGG AAA TTA TCA GAA GTG AAT AAT TAG CCA TTC TGT ATT CCG CTA
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FIG. 8E

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3781
ATG GGC AAT ATT TTT AAA GAA GAA AAG GAA ACT ATA AAA TAT TAA CAG CCT CCT AGC GAT
3841
GCC GAA AAG CCC TTT GAT AAA AAA AGA ATC ATC ATC TTA AGA AAT TCT TAG TCA TTT ATT
3901
ATG TAA ATG CTT ATA AAT TCG GCC CTA TAA TCT GAT AAA TTA TTA AGG GCA AAC TTA TGT

3961          VanR  MET SER ASP LYS ILE LEU ILE VAL ASP ASP GLU HIS GLU ILE ALA
GAA AGG GTG ATA ACT ATG AGC GAT AAA ATA CTT ATT GTG GAT GAT GAA CAT GAA ATT GCC
4021
ASP LEU VAL GLU LEU TYR LEU LYS ASN GLU ASN TYR THR VAL PHE LYS TYR TYR THR ALA
GAT TTG GTT GAA TTA TAC TTA AAA AAC GAG AAT TAT ACG GTT TTC AAA TAC TAT ACC GCC
4081
LYS GLU ALA LEU GLU CYS ILE ASP LYS SER GLU ILE ASP LEU ALA ILE LEU ASP ILE MET
AAA GAA GCA TTG GAA TGT ATA GAC AAG TCT GAG ATT GAC CTT GCC ATA TTG GAC ATC ATG
4141
LEU PRO GLY THR SER GLY LEU THR ILE CYS GLN LYS ILE ARG ASP LYS HIS THR TYR PRO
CTT CCC GGC ACA AGC GGC CTT ACT ATC TGT CAA AAA ATA AGG GAC AAG CAC ACC TAT CCG
4201
ILE ILE MET LEU THR GLY LYS ASP THR GLU VAL ASP LYS ILE THR GLY LEU THR ILE GLY
ATT ATC ATG CTG ACC GGG AAA GAT ACA GAG GTA GAT AAA ATT ACA GGG TTA ACA ATC GGC
4261
ALA ASP ASP TYR ILE THR LYS PRO PHE ARG PRO LEU GLU LEU ILE ALA ARG VAL LYS ALA
GCG GAT GAT TAT ATA ACG AAG CCC TTT CGC CCA CTG GAG TTA ATT GCT CGG GTA AAG GCC
4321
GLN LEU ARG ARG TYR LYS LYS PHE SER GLY VAL LYS GLU GLN ASN GLU ASN VAL ILE VAL
CAG TTG CGC CGA TAC AAA AAA TTC AGT GGA GTA AAG GAG CAG AAC GAA AAT GTT ATC GTC
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FIG. 8F

FIG. 8G

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4381
HIS SER GLY LEU VAL ILE ASN VAL ASN THR HIS GLU CYS TYR LEU ASN GLU LYS GLN LEU
CAC TCC GGC CTT GTC ATT AAT GTT AAC ACC CAT GAG TGT TAT CTG AAC GAG AAG CAG TTA
4441
SER LEU THR PRO THR GLU PHE SER ILE LEU ARG ILE LEU CYS GLU ASN LYS GLY ASN VAL
TCC CTT ACT CCC ACC GAG TTT TCA ATA CTG CGA ATC CTC TGT GAA AAC AAG GGG AAT GTG
4501
VAL SER SER GLU LEU LEU PHE HIS GLU ILE TRP GLY ASP GLU TYR PHE SER LYS SER ASN
GTT AGC TCC GAG CTG CTA TTT CAT GAG ATA TGG GGC GAC GAA TAT TTC AGC AAG AGC AAC
4561
ASN THR ILE THR VAL HIS ILE ARG HIS LEU ARG GLU LYS MET ASN ASP THR ILE ASP ASN
AAC ACC ATC ACC GTG CAT ATC CGG CAT TTG CGC GAA AAA ATG AAC GAC ACC ATT GAT AAT
4621
PRO LYS TYR ILE LYS THR VAL TRP GLY VALGLYTYRLYSILEGLULYS
CCG AAA TAT ATA AAA ACG GTA TGG GGG GTTGGTTATAAAATTGAAAAAT AAA AAA AAC GAC
                                VanS    LEUVALILELYSLEULYSASN LYS LYS ASN ASP
4682
TYR SER LYS LEU GLU ARG LYS LEU TYR MET TYR ILE VAL ALA ILE VAL VAL VAL ALA ILE
TAT TCC AAA CTA GAA CGA AAA CTT TAC ATG TAT ATC GTT GCA ATT GTT GTG GTA GCA ATT
4742
VAL PHE VAL LEU TYR ILE ARG SER MET ILE ARG GLY LYS LEU GLY ASP TRP ILE LEU SER
GTA TTC GTG TTG TAT ATT CGT TCA ATG ATC CGA GGG AAA CTT GGG GAT TGG ATC TTA AGT
4802
ILE LEU GLU ASN LYS TYR ASP LEU ASN HIS LEU ASP ALA MET LYS LEU TYR GLN TYR SER
ATT TTG GAA AAC AAA TAT GAC TTA AAT CAC CTG GAC GCG ATG AAA TTA TAT CAA TAT TCC
4862
ILE ARG ASN ASN ILE ASP ILE PHE ILE TYR VAL ALA ILE VAL ILE SER ILE LEU ILE LEU
ATA CGG AAC AAT ATA GAT ATC TTT ATT TAT GTG GCG ATT GTC ATT AGT ATT CTT ATT CTA
4922
CYS ARG VAL MET LEU SER LYS PHE ALA LYS TYR PHE ASP GLU ILE ASN THR GLY ILE ASP
TGT CGC GTC ATG CTT TCA AAA TTC GCA AAA TAC TTT GAC GAG ATA AAT ACC GGC ATT GAT
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4982
VAL LEU ILE GLN ASN GLU ASP LYS GLN ILE GLU LEU SER ALA GLU MET ASP VAL MET GLU
GTA CTT ATT CAG AAC GAA GAT AAA CAA ATT GAG CTT TCT GCG GAA ATG GAT GTT ATG GAA
5042
GLN LYS LEU ASN THR LEU LYS ARG THR LEU GLU LYS ARG GLU GLN ASP ALA LYS LEU ALA
CAA AAG CTC AAC ACA TTA AAA CGG ACT CTG GAA AAG CGA GAG CAG GAT GCA AAG CTG GCC
5102
GLU GLN ARG LYS ASN ASP VAL VAL MET TYR LEU ALA HIS ASP ILE LYS THR PRO LEU THR
GAA CAA AGA AAA AAT GAC GTT GTT ATG TAC TTG GCG CAC GAT ATT AAA ACG CCC CTT ACA
5162
SER ILE ILE GLY TYR LEU SER LEU LEU ASP GLU ALA PRO ASP MET PRO VAL ASP GLN LYS
TCC ATT ATC GGT TAT TTG AGC CTG CTT GAC GAG GCT CCA GAC ATG CCG GTA GAT CAA AAG
5222
ALA LYS TYR VAL HIS ILE THR LEU ASP LYS ALA TYR ARG LEU GLU GLN LEU ILE ASP GLU
GCA AAG TAT GTG CAT ATC ACG TTG GAC AAA GCG TAT CGA CTC GAA CAG CTA ATC GAC GAG
5282
PHE PHE GLU ILE THR ARG TYR ASN LEU GLN THR ILE THR LEU THR LYS THR HIS ILE ASP
TTT TTT GAG ATT ACA CGG TAT AAC CTA CAA ACG ATA ACG CTA ACA AAA ACG CAC ATA GAC
5342
LEU TYR TYR MET LEU VAL GLN MET THR ASP GLU PHE TYR PRO GLN LEU SER ALA HIS GLY
CTA TAC TAT ATG CTG GTG CAG ATG ACC GAT GAA TTT TAT CCT CAG CTT TCC GCA CAT GGA
5402
LYS GLN ALA VAL ILE HIS ALA PRO GLU ASP LEU THR VAL SER GLY ASP PRO ASP LYS LEU
AAA CAG GCG GTT ATT CAC GCC CCC GAG GAT CTG ACC GTG TCC GGC GAC CCT GAT AAA CTC
5462
ALA ARG VAL PHE ASN ASN ILE LEU LYS ASN ALA ALA ALA TYR SER GLU ASP ASN SER ILE
GCG AGA GTC TTT AAC AAC ATT TTG AAA AAC GCC GCT GCA TAC AGT GAG GAT AAC AGC ATC

FIG. 8H

5522
ILE ASP ILE THR ALA GLY LEU SER GLY ASP VAL VAL SER ILE GLU PHE LYS ASN THR GLY
ATT GAC ATT ACC GCG GGC CTC TCC GGG GAT GTG GTG TCA ATC GAA TTC AAG AAC ACT GGA
5582
SER ILE PRO LYS ASP LYS LEU ALA ALA ILE PHE GLU LYS PHE TYR ARG LEU ASP ASN ALA
AGC ATC CCA AAA GAT AAG CTA GCT GCC ATA TTT GAA AAG TTC TAT AGG CTG GAC AAT GCT
5642
ARG SER SER ASP THR GLY GLY ALA GLY LEU GLY LEU ALA ILE ALA LYS GLU ILE ILE VAL
CGT TCT TCC GAT ACG GGT GGC GCG GGA CTT GGA TTG GCG ATT GCA AAA GAA ATT ATT GTT
5702
GLN HIS GLY GLY GLN ILE TYR ALA GLU SER ASN ASP ASN TYR THR THR PHE ARG VAL GLU
CAG CAT GGA GGG CAG ATT TAC GCG GAA AGC AAT GAT AAC TAT ACG ACG TTT AGG GTA GAG
5762
LEU PRO ALA MET PRO ASP LEU VAL ASP LYS ARG ARG SER
CTT CCA GCG ATG CCA GAC TTG GTT GAT AAA AGG AGG TCC TAA GA GAT GTA TAT AAT TTT
5821
TTA GGA AAA TCT CAA GGT TAT CTT TAC TTT TTC TTA GGA AAT TAA CAA TTT AAT ATT AAG
5881
AAA CGG CTC GTT CTT ACA CGG TAG ACT TAA TAC CGT AAG AAC GAG CCG TTT TCG TTC TTC
5941
AGA GAA AGA TTT GAC AAG ATT ACC ATT GGC ATC CCC GTT TTA TTT GGT GCC TTT CAC AGA
6001

VanH MET ASN ASN ILE GLY ILE THR VAL TYR GLY CYS GLU GLN ASP GLU
AAGGGTTGG TCT TAA TT ATG AAT AAC ATC GGC ATT ACT GTT TAT GGA TGT GAG CAG GAT GAG
6063
ALA ASP ALA PHE HIS ALA LEU SER PRO ARG PHE GLY VAL MET ALA THR ILE ILE ASN ALA
GCA GAT GCA TTC CAT GCT CTT TCG CCT CGC TTT GGC GTT ATG GCA ACG ATA ATT AAC GCC
6123

FIG. 8I

ASN VAL SER GLU SER ASN ALA LYS SER ALA PRO PHE ASN GLN CYS ILE SER VAL GLY HIS
AAC GTG TCG GAA TCC AAC GCC AAA TCC GCG CCT TTC AAT CAA TGT ATC AGT GTG GGA CAT
6183
LYS SER GLU ILE SER ALA SER ILE LEU LEU ALA LEU LYS ARG ALA GLY VAL LYS TYR ILE
AAA TCA GAG ATT TCC GCC TCT ATT CTT CTT GCG CTG AAG AGA GCC GGT GTG AAA TAT ATT
6243
SER THR ARG SER ILE GLY CYS ASN HIS ILE ASP THR THR ALA ALA LYS ARG MET GLY ILE
TCT ACC CGA AGC ATC GGC TGC AAT CAT ATA GAT ACA ACT GCT GCT AAG AGA ATG GGC ATC
6303
THR VAL ASP ASN VAL ALA TYR SER PRO ASP SER VAL ALA ASP TYR THR MET MET LEU ILE
ACT GTC GAC AAT GTG GCG TAC TCG CCG GAT AGC GTT GCC GAT TAT ACT ATG ATG CTA ATT
6363
LEU MET ALA VAL ARG ASN VAL LYS SER ILE VAL ARG SER VAL GLU LYS HIS ASP PHE ARG
CTT ATG GCA GTA CGC AAC GTA AAA TCG ATT GTG CGC TCT GTG GAA AAA CAT GAT TTC AGG
6423
LEU ASP SER ASP ARG GLY LYS VAL LEU SER ASP MET THR VAL GLY VAL VAL GLY THR GLY
TTG GAC AGC GAC CGT GGC AAG GTA CTC AGC GAC ATG ACA GTT GGT GTG GTG GGA ACG GGC
6483
GLN ILE GLY LYS ALA VAL ILE GLU ARG LEU ARG GLY PHE GLY CYS LYS VAL LEU ALA TYR
CAG ATA GGC AAA GCG GTT ATT GAG CGG CTG CGA GGA TTT GGA TGT AAA GTG TTG GCT TAT
6543
SER ARG SER ARG SER ILE GLU VAL ASN TYR VAL PRO PHE ASP GLU LEU LEU GLN ASN SER
AGT CGC AGC CGA AGT ATA GAG GTA AAC TAT GTA CCG TTT GAT GAG TTG CTG CAA AAT AGC
6603
ASP ILE VAL THR LEU HIS VAL PRO LEU ASN THR ASP THR HIS TYR ILE ILE SER HIS GLU
GAT ATC GTT ACG CTT CAT GTG CCG CTC AAT ACG GAT ACG CAC TAT ATT ATC AGC CAC GAA
6663
GLN ILE GLN ARG MET LYS GLN GLY ALA PHE LEU ILE ASN THR GLY ARG GLY PRO LEU VAL
CAA ATA CAG AGA ATG AAG CAA GGA GCA TTT CTT ATC AAT ACT GGG CGC GGT CCA CTT GTA

FIG. 8J

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6723
ASP THR TYR GLU LEU VAL LYS ALA LEU GLU ASN GLY LYS LEU GLY GLY ALA ALA LEU ASP
GAT ACC TAT GAG TTG GTT AAA GCA TTA GAA AAC GGG AAA CTG GGC GGT GCC GCA TTG GAT
6783
VAL LEU GLU GLY GLU GLU GLU PHE PHE TYR SER ASP CYS THR GLN LYS PRO ILE ASP ASN
GTA TTG GAA GGA GAG GAA GAG TTT TTC TAC TCT GAT TGC ACC CAA AAA CCA ATT GAT AAT
6843
GLN PHE LEU LEU LYS LEU GLN ARG MET PRO ASN VAL ILE ILE THR PRO HIS THR ALA TYR
CAA TTT TTA CTT AAA CTT CAA AGA ATG CCT AAC GTG ATA ATC ACA CCG CAT ACG GCC TAT
6903
TYR THR GLU GLN ALA LEU ARG ASP THR VAL GLU LYS THR ILE LYS ASN CYS LEU ASP PHE
TAT ACC GAG CAA GCG TTG CGT GAT ACC GTT GAA AAA ACC ATT AAA AAC TGT TTG GAT TTT
6963
            VanA     METASN ARG ILE LYS VAL ALA ILE LEU PHE GLY GLY CYS SER
GAA AGG AGA CAG GAG CATGAAT AGA ATA AAA GTT GCA ATA CTG TTT GGG GGT TGC TCA
GLU ARG ARG GLN GLU HISGLU
7021
GLU GLU HIS ASP VAL SER VAL LYS SER ALA ILE GLU ILE ALA ALA ASN ILE ASN LYS GLU
GAG GAG CAT GAC GTA TCG GTA AAA TCT GCA ATA GAG ATA GCC GCT AAC ATT AAT AAA GAA
7081
LYS TYR GLU PRO LEU TYR ILE GLY ILE THR LYS SER GLY VAL TRP LYS MET CYS GLU LYS
AAA TAC GAG CCG TTA TAC ATT GGA ATT ACG AAA TCT GGT GTA TGG AAA ATG TGC GAA AAA
7141
PRO CYS ALA GLU TRP GLU ASN ASP ASN CYS TYR SER ALA VAL LEU SER PRO ASP LYS LYS
CCT TGC GCG GAA TGG GAA AAC GAC AAT TGC TAT TCA GCT GTA CTC TCG CCG GAT AAA AAA
7201
MET HIS GLY LEU LEU VAL LYS LYS ASN HIS GLU TYR GLU ILE ASN HIS VAL ASP VAL ALA
ATG CAC GGA TTA CTT GTT AAA AAG AAC CAT GAA TAT GAA ATC AAC CAT GTT GAT GTA GCA
7261
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FIG. 8K

PHE SER ALA LEU HIS GLY LYS SER GLY GLU ASP GLY SER ILE GLN GLY LEU PHE GLU LEU
TTT TCA GCT TTG CAT GGC AAG TCA GGT GAA GAT GGA TCC ATA CAA GGT CTG TTT GAA TTG
7321
SER GLY ILE PRO PHE VAL GLY CYS ASP ILE GLN SER SER ALA ILE CYS MET ASP LYS SER
TCC GGT ATC CCT TTT GTA GGC TGC GAT ATT CAA AGC TCA GCA ATT TGT ATG GAC AAA TCG
7381
LEU THR TYR ILE VAL ALA LYS ASN ALA GLY ILE ALA THR PRO ALA PHE TRP VAL ILE ASN
TTG ACA TAC ATC GTT GCG AAA AAT GCT GGG ATA GCT ACT CCC GCC TTT TGG GTT ATT AAT
7441
LYS ASP ASP ARG PRO VAL ALA ALA THR PHE THR TYR PRO VAL PHE VAL LYS PRO ALA ARG
AAA GAT GAT AGG CCG GTG GCA GCT ACG TTT ACC TAT CCT GTT TTT GTT AAG CCG GCG CGT
7501
SER GLY SER SER PHE GLY VAL LYS LYS VAL ASN SER ALA ASP GLU LEU ASP TYR ALA ILE
TCA GGC TCA TCC TTC GGT GTG AAA AAA GTC AAT AGC GCG GAC GAA TTG GAC TAC GCA ATT
7561
GLU SER ALA ARG GLN TYR ASP SER LYS ILE LEU ILE GLU GLN ALA VAL SER GLY CYS GLU
GAA TCG GCA AGA CAA TAT GAC AGC AAA ATC TTA ATT GAG CAG GCT GTT TCG GGC TGT GAG
7621
VAL GLY CYS ALA VAL LEU GLY ASN SER ALA ALA LEU VAL VAL GLY GLU VAL ASP GLN ILE
GTC GGT TGT GCG GTA TTG GGA AAC AGT GCC GCG TTA GTT GTT GGC GAG GTG GAC CAA ATC
7681
ARG LEU GLN TYR GLY ILE PHE ARG ILE HIS GLN GLU VAL GLU PRO GLU LYS GLY SER GLU
AGG CTG CAG TAC GGA ATC TTT CGT ATT CAT CAG GAA GTC GAG CCG GAA AAA GGC TCT GAA
7741
ASN ALA VAL ILE THR VAL PRO ALA ASP LEU SER ALA GLU GLU ARG GLY ARG ILE GLN GLU
AAC GCA GTT ATA ACC GTT CCC GCA GAC CTT TCA GCA GAG GAG CGA GGA CGG ATA CAG GAA
7801
THR ALA LYS LYS ILE TYR LYS ALA LEU GLY CYS ARG GLY LEU ALA ARG VAL ASP MET PHE
ACG GCA AAA AAA ATA TAT AAA GCG CTC GGC TGT AGA GGT CTA GCC CGT GTG GAT ATG TTT

FIG. 8L

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7861
LEU GLN ASP ASN GLY ARG ILE VAL LEU ASN GLU VAL ASN THR LEU PRO GLY PHE THR SER
TTA CAA GAT AAC GGC CGC ATT GTA CTG AAC GAA GTC AAT ACT CTG CCC GGT TTC ACG TCA
7921
TYR SER ARG TYR PRO ARG MET MET ALA ALA ALA GLY ILE ALA LEU PRO GLU LEU ILE ASP
TAC AGT CGT TAT CCC CGT ATG ATG GCC GCT GCA GGT ATT GCA CTT CCC GAA CTG ATT GAC
7981
ARG LEU ILE VAL LEU ALA LEU LYS GLY
CGC TTG ATC GTA TTA GCG TTA AAG GGG TGATAAGC ATG GAA ATA GGA TTT ACT TTT TTA GAT
                                    VanX    MET GLU ILE GLY PHE THR PHE LEU ASP
8043
GLU ILE VAL HIS GLY VAL ARG TRP ASP ALA LYS TYR ALA THR TRP ASP ASN PHE THR GLY
GAA ATA GTA CAC GGT GTT CGT TGG GAC GCT AAA TAT GCC ACT TGG GAT AAT TTC ACC GGA
8103
LYS PRO VAL ASP GLY TYR GLU VAL ASN ARG ILE VAL GLY THR TYR GLU LEU ALA GLU SER
AAA CCG GTT GAC GGT TAT GAA GTA AAT CGC ATT GTA GGG ACA TAC GAG TTG GCT GAA TCG
8163
LEU LEU LYS ALA LYS GLU LEU ALA ALA THR GLN GLY TYR GLY LEU LEU LEU TRP ASP GLY
CTT TTG AAG GCA AAA GAA CTG GCT GCT ACC CAA GGG TAC GGA TTG CTT CTA TGG GAC GGT
8223
TYR ARG PRO LYS ARG ALA VAL ASN CYS PHE MET GLN TRP ALA ALA GLN PRO GLU ASN ASN
TAC CGT CCT AAG CGT GCT GTA AAC TGT TTT ATG CAA TGG GCT GCA CAG CCG GAA AAT AAC
8283
LEU THR LYS GLU SER TYR TYR PRO ASN ILE ASP ARG THR GLU MET ILE SER LYS GLY TYR
CTG ACA AAG GAA AGT TAT TAT CCC AAT ATT GAC CGA ACT GAG ATG ATT TCA AAA GGA TAC
8343
VAL ALA SER LYS SER SER HIS SER ARG GLY SER ALA ILE ASP LEU THR LEU TYR ARG LEU
GTG GCT TCA AAA TCA AGC CAT AGC CGC GGC AGT GCC ATT GAT CTT ACG CTT TAT CGA TTA
8403
ASP THR GLY GLU LEU VAL PRO MET GLY SER ARG PHE ASP PHE MET ASP GLU ARG SER HIS
GAC ACG GGT GAG CTT GTA CCA ATG GGG AGC CGA TTT GAT TTT ATG GAT GAA CGC TCT CAT
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FIG. 8M

8463
HIS ALA ALA ASN GLY ILE SER CYS ASN GLU ALA GLN ASN ARG ARG ARG LEU ARG SER ILE
CAT GCG GCA AAT GGA ATA TCA TGC AAT GAA GCG CAA AAT CGC AGA CGT TTG CGC TCC ATC
8523
MET GLU ASN SER GLY PHE GLU ALA TYR SER LEU GLU TRP TRP HIS TYR VAL LEU ARG ASP
ATG GAA AAC AGT GGG TTT GAA GCA TAT AGC CTC GAA TGG TGG CAC TAT GTA TTA AGA GAC
8583
GLU PRO TYR PRO ASN SER TYR PHE ASP PHE PRO VAL LYS
GAA CCA TAC CCC AAT AGC TAT TTT GAT TTC CCC GTT AAA TAAA CTT TTA ACC GTT GCA
8641
CGG ACA AAC TAT ATA AGC TAA CTC TTT CGG CAG GAA ACC CGA CGT ATG TAA CTG GTT CTT
8701
AGG GAA TTT ATA TAT AGT AGA TAG TAT TGA AGA TGT AAG GCA GAG CGA TAT TGC GGT CAT
8761
TAT CTG CGT GCG CTG CGG CAA GAT AGC CTG ATA ATA AGA CTG ATC GCA TAG AGG GGT GGT
8821
ATT TCA CAC CGC CCA TTG TCA ACA GGC AGT TCA GCC TCG TTA AAT TCA GCA TGG GTA TCA
8881
CTT ATG AAA ATT CAT CTA CAT TGG TGA TAA TAG TAA ATC CAG TAG GGC GAA ATA ATT GAC
8941
TGT AAT TTA CGG GGC AAA ACG GCA CAA TCT CAA ACG AGA TTG TGC CGT TTA AGG GGA AGA
9001

VanY MET LYS LYS
TTC TAG AAA TAT TTC ATA CTT CCA ACT ATA TAG TTA AGG AGG AGA CTG AAA ATG AAG AAG
9061
LEU PHE PHE LEU LEU LEU LEU LEU PHE LEU ILE TYR LEU GLY TYR ASP TYR VAL ASN GLU
TTG TTT TTT TTA TTG TTA TTG TTA TTC TTA ATA TAC TTA GGT TAT GAC TAC GTT AAT GAA

FIG. 8N

9121
ALA LEU PHE SER GLN GLU LYS VAL GLU PHE GLN ASN TYR ASP GLN ASN PRO LYS GLU HIS
GCA CTG TTT TCT CAG GAA AAA GTC GAA TTT CAA AAT TAT GAT CAA AAT CCC AAA GAA CAT
9181
LEU GLU ASN SER GLY THR SER GLU ASN THR GLN GLU LYS THR ILE THR GLU GLU GLN VAL
TTA GAA AAT AGT GGG ACT TCT GAA AAT ACC CAA GAG AAA ACA ATT ACA GAA GAA CAG GTT
9241
TYR GLN GLY ASN LEU LEU LEU ILE ASN SER LYS TYR PRO VAL ARG GLN GLU SER VAL LYS
TAT CAA GGA AAT CTG CTA TTA ATC AAT AGT AAA TAT CCT GTT CGC CAA GAA AGT GTG AAG
9301
SER ASP ILE VAL ASN LEU SER LYS HIS ASP GLU LEU ILE ASN GLY TYR GLY LEU LEU ASP
TCA GAT ATC GTG AAT TTA TCT AAA CAT GAC GAA TTA ATA AAT GGA TAC GGG TTG CTT GAT
9361
SER ASN ILE TYR MET SER LYS GLU ILE ALA GLN LYS PHE SER GLU MET VAL ASN ASP ALA
AGT AAT ATT TAT ATG TCA AAA GAA ATA GCA CAA AAA TTT TCA GAG ATG GTC AAT GAT GCT
9421
VAL LYS GLY GLY VAL SER HIS PHE ILE ILE ASN SER GLY TYR ARG ASP PHE ASP GLU GLN
GTA AAG GGT GGC GTT AGT CAT TTT ATT ATT AAT AGT GGC TAT CGA GAC TTT GAT GAG CAA
9481
SER VAL LEU TYR GLN GLU MET GLY ALA GLU TYR ALA LEU PRO ALA GLY TYR SER GLU HIS
AGT GTG CTT TAC CAA GAA ATG GGG GCT GAG TAT GCC TTA CCA GCA GGT TAT AGT GAG CAT
9541
ASN SER GLY LEU SER LEU ASP VAL GLY SER SER LEU THR LYS MET GLU ARG ALA PRO GLU
AAT TCA GGT TTA TCA CTA GAT GTA GGA TCA AGC TTG ACG AAA ATG GAA CGA GCC CCT GAA
9601
GLY LYS TRP ILE GLU GLU ASN ALA TRP LYS TYR GLY PHE ILE LEU ARG TYR PRO GLU ASP
GGA AAG TGG ATA GAA GAA AAT GCT TGG AAA TAC GGG TTC ATT TTA CGT TAT CCA GAG GAC
9661
LYS THR GLU LEU THR GLY ILE GLN TYR GLU PRO TRP HIS ILE ARG TYR VAL GLY LEU PRO
AAA ACA GAG TTA ACA GGA ATT CAA TAT GAA CCA TGG CAT ATT CGC TAT GTT GGT TTA CCA
9721

FIG. 80

```
HIS SER ALA ILE MET LYS GLU LYS ASN PHE VAL LEU GLU GLU TYR MET ASP TYR LEU LYS
CAT AGT GCG ATT ATG AAA GAA AAG AAT TTC GTT CTC GAG GAA TAT ATG GAT TAC CTA AAA
9781
GLU GLU LYS THR ILE SER VAL SER VAL ASN GLY GLU LYS TYR GLU ILE PHE TYR TYR PRO
GAA GAA AAA ACC ATT TCT GTT AGT GTA AAT GGG GAA AAA TAT GAG ATC TTT TAT TAT CCT
9841
VAL THR LYS ASN THR THR ILE HIS VAL PRO THR ASN LEU ARG TYR GLU ILE SER GLY ASN
GTT ACT AAA AAT ACC ACC ATT CAT GTG CCG ACT AAT CTT CGT TAT GAG ATA TCA GGA AAC
9901
ASN ILE ASP GLY VAL ILE VAL THR VAL PHE PRO GLY SER THR HIS THR ASN SER ARG ARG
AAT ATA GAC GGT GTA ATT GTG ACA GTG TTT CCC GGA TCA ACA CAT ACT AAT TCA AGG AGG
9961
TAA GGA TGG CGG AAT GAA ACC AAC GAA ATT AAT GAA CAG CAT TAT TGT ACT AGC ACT TTT
10021
GGG GTA ACG TTA GCT TTT TAA TTT AAA ACC CAC GTT AAC TAG GAC ATT GCT ATA CTA ATG

10081                                    VanZ      LEU GLY LYS ILE LEU SER ARG GLY LEU
ATA CAA CTT AAA CAA AAG AATTAGAGG AAA TTA TA TTG GGA AAA ATA TTA TCT AGA GGA TTG
10143
LEU ALA LEU TYR LEU VAL THR LEU ILE TRP LEU VAL LEU PHE LYS LEU GLN TYR ASN ILE
CTA GCT TTA TAT TTA GTG ACA CTA ATC TGG TTA GTG TTA TTC AAA TTA CAA TAC AAT ATT
10203
LEU SER VAL PHE ASN TYR HIS GLN ARG SER LEU ASN LEU THR PRO PHE THR ALA THR GLY
TTA TCA GTA TTT AAT TAT CAT CAA AGA AGT CTT AAC TTG ACT CCA TTT ACT GCT ACT GGG
10263
ASN PHE ARG GLU MET ILE ASP ASN VAL ILE ILE PHE ILE PRO PHE GLY LEU LEU LEU ASN
AAT TTC AGA GAG ATG ATA GAT AAT GTT ATA ATC TTT ATT CCA TTT GGC TTG CTT TTG AAT
```

FIG. 8P

10323
VAL ASN PHE LYS GLU ILE GLY PHE LEU PRO LYS PHE ALA PHE VAL LEU VAL LEU SER LEU
GTC AAT TTT AAA GAA ATC GGA TTT TTA CCT AAG TTT GCT TTT GTA CTG GTT TTA AGT CTT
10383
THR PHE GLU ILE ILE GLN PHE ILE PHE ALA ILE GLY ALA THR ASP ILE THR ASP VAL ILE
ACT TTT GAA ATA ATT CAA TTT ATC TTC GCT ATT GGA GCG ACA GAC ATA ACA GAT GTA ATT
10443
THR ASN THR VAL GLY GLY PHE LEU GLY LEU LYS LEU TYR GLY LEU SER ASN LYS HIS MET
ACA AAT ACT GTT GGA GGC TTT CTT GGA CTG AAA TTA TAT GGT TTA AGC AAT AAG CAT ATG
10503
ASN GLN LYS LYS LEU ASP ARG VAL ILE ILE PHE VAL GLY ILE LEU LEU LEU VAL LEU LEU
AAT CAA AAA AAA TTA GAC AGA GTT ATT ATT TTT GTA GGT ATA CTT TTG CTC GTA TTA TTG
10563
LEU VAL TYR ARG THR HIS LEU ARG ILE ASN TYR VAL
CTC GTT TAC CGT ACC CAT TTA AGA ATA AAT TAC GTG TAAG ATG TCT AAA TCA AGC AAT
10621
CTG ATC TTT CAT ACA CAT AAA GAT ATT GAA TGA ATT GGA TTA GAT GGA AAA CGG GAT GTG
10681
GGG AAA CTC GCC CGT AGG TGT GAA GTG AGG GGA AAA CCG GTG ATA AAG TAA AAA GCT TAC
10741
CTA ACA CTA TAG TAA CAA AGA AAG CCC AAT TAT CAA TTT TAG TGC TGA GGA ATT GGT CTC
10801
TTT AAT AAA TTT CCT TAA CGT TGT AAA TCC GCA TTT TCC TGA CGG TAC CCC

FIG. 8Q

Ib brin(-)

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1
CAA AAT ATC ACC TCA TTT TTG AGA CAA GTC TTA TGA GAC GCT CTT AAC TAT GAT TTT ATC
61
AGT CTA CTA CAT TTG TAT CAA TAG AGT ACA CTC TAT TGA TAT ATA ATT GAA CTA ATA AAT

121              Transposase                MET LYS ILE ALA ARG GLY ARG GLU LEU LEU THR
TGA AAA TAC AGA AAT GGA ATGATACTG AA ATG AAA ATT GCG AGA GGT AGA GAA TTG CTT ACA
182
PRO GLU GLN ARG GLN ALA PHE MET GLN ILE PRO GLU ASP GLU TRP ILE LEU GLY THR TYR
CCG GAA CAG AGA CAG GCT TTT ATG CAA ATC CCT GAA GAT GAA TGG ATA CTG GGG ACC TAC
242
PHE THR PHE SER LYS ARG ASP LEU GLU ILE VAL ASN LYS ARG ARG ARG GLU GLU ASN ARG
TTC ACT TTT TCC AAA CGG GAT TTA GAA ATA GTT AAT AAG CGA AGG AGG GAA GAA AAC CGT
302
LEU GLY PHE ALA VAL GLN LEU ALA VAL LEU ARG TYR PRO GLY TRP PRO TYR THR HIS ILE
TTA GGA TTT GCT GTT CAA TTA GCT GTT CTT CGG TAT CCC GGT TGG CCA TAC ACT CAT ATC
362
LYS SER ILE PRO ASP SER VAL ILE GLN TYR ILE SER LYS GLN ILE GLY VAL SER PRO SER
AAA AGC ATC CCA GAT TCG GTC ATA CAA TAT ATA TCG AAA CAG ATT GGT GTT AGT CCA TCC
422
SER LEU ASP HIS TYR PRO GLN ARG GLU ASN THR LEU TRP ASP HIS LEU LYS GLU ILE ARG
TCG CTT GAT CAT TAT CCT CAA AGG GAA AAT ACA CTT TGG GAT CAT TTG AAA GAA ATT CGA
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FIG. 8R

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482
SER GLU TYR ASP PHE VAL THR PHE THR LEU SER GLU TYR ARG MET THR PHE LYS TYR LEU
AGT GAA TAC GAC TTT GTA ACT TTT ACC CTG AGT GAA TAT CGA ATG ACA TTT AAG TAC CTT
542
HIS GLN LEU ALA LEU GLU ASN GLY ASP ALA ILE HIS LEU LEU HIS GLU CYS ILE ASP PHE
CAT CAA TTA GCT TTG GAA AAT GGT GAT GCC ATT CAT CTA CTG CAT GAA TGC ATA GAT TTT
602
LEU ARG LYS ASN LYS ILE ILE LEU PRO ALA ILE THR THR LEU GLU ARG MET VAL TRP GLU
CTA AGA AAA AAC AAA ATT ATA CTG CCT GCT ATC ACT ACA CTT GAA AGA ATG GTG TGG GAA
662
ALA ARG ALA MET ALA GLU LYS LYS LEU PHE ASN THR VAL SER LYS SER LEU THR ASN GLU
GCA AGG GCA ATG GCT GAA AAG AAG CTA TTT AAT ACG GTT AGT AAA TCT CTA ACA AAT GAG
722
GLN LYS GLU LYS LEU GLU GLY ILE ILE THR SER GLN HIS PRO SER GLU SER ASN LYS THR
CAA AAA GAA AAG CTT GAA GGG ATT ATT ACC TCG CAG CAT CCA TCC GAA TCC AAT AAA ACG
782
ILE LEU GLY TRP LEU LYS GLU PRO PRO GLY HIS PRO SER PRO GLU THR PHE LEU LYS ILE
ATA TTG GGT TGG TTA AAA GAG CCA CCG GGT CAT CCT TCA CCC GAA ACT TTT CTA AAA ATA
842
ILE GLU ARG LEU GLU TYR ILE ARG GLY MET ASP LEU GLU THR VAL GLN ILE SER HIS LEU
ATA GAA CGA CTC GAA TAC ATA CGA GGA ATG GAT TTA GAA ACA GTG CAA ATT AGT CAT TTG
902
HIS ARG ASN ARG LEU LEU GLN LEU SER ARG LEU GLY SER ARG TYR GLU PRO TYR ALA PHE
CAC CGT AAC CGC CTG TTG CAG CTG TCT CGC TTA GGC TCA AGA TAC GAG CCG TAT GCA TTC
962
ARG ASP PHE GLN GLU ASN LYS ARG TYR SER ILE LEU THR ILE TYR LEU LEU GLN LEU THR
CGT GAC TTT CAA GAA AAT AAA CGT TAT TCG ATA TTA ACC ATC TAT TTA TTA CAA CTT ACT
1022
GLN GLU LEU THR ASP LYS ALA PHE GLU ILE HIS ASP ARG GLN ILE LEU SER LEU LEU SER
CAG GAG CTA ACG GAT AAA GCG TTT GAA ATT CAT GAT AGG CAA ATA CTT AGT TTG TTA TCA
```

FIG. 8S

1082
LYS GLY ARG LYS ALA GLN GLU GLU ILE GLN LYS GLN ASN GLY LYS LYS LEU ASN GLU LYS
AAA GGT CGT AAG GCT CAA GAG GAA ATC CAG AAA CAA AAC GGT AAA AAG CTA AAT GAG AAA
1142
VAL ILE HIS PHE THR ASN ILE GLY GLN ALA LEU ILE LYS ALA ARG GLU GLU LYS LEU ASP
GTT ATA CAC TTT ACG AAC ATC GGA CAA GCA TTA ATT AAA GCA AGA GAG GAA AAA TTA GAC
1202
VAL PHE LYS VAL LEU GLU SER VAL ILE GLU TRP ASN THR PHE VAL SER SER VAL GLU GLU
GTT TTT AAG GTT TTA GAA TCG GTT ATT GAA TGG AAT ACC TTT GTC TCT TCA GTA GAA GAG
1262
ALA GLN GLU LEU ALA ARG PRO ALA ASP TYR ASP TYR LEU ASP LEU LEU GLN LYS ARG PHE
GCT CAG GAA CTT GCA CGT CCT GCC GAC TAT GAT TAT TTA GAC TTA CTG CAA AAA CGG TTT
1322
TYR SER LEU ARG LYS TYR THR PRO THR LEU LEU ARG VAL LEU GLU PHE HIS SER THR LYS
TAT TCA CTA AGA AAA TAT ACG CCA ACG CTA TTA AGA GTA TTG GAA TTT CAT TCT ACA AAG
1382
ALA ASN GLU PRO LEU LEU GLN ALA VAL GLU ILE ILE ARG GLY MET ASN GLU SER GLY LYS
GCA AAT GAG CCA CTT TTA CAA GCT GTT GAG ATT ATC CGA GGA ATG AAC GAA TCT GGA AAG
1442
ARG LYS VAL PRO ASP ASP SER PRO VAL ASP PHE ILE SER LYS ARG TRP LYS ARG HIS LEU
CGA AAA GTG CCT GAT GAC TCA CCT GTG GAT TTT ATT TCA AAA CGA TGG AAA AGA CAT TTA
1502
TYR GLU ASP ASP GLY THR THR ILE ASN ARG HIS TYR TYR GLU MET ALA VAL LEU THR GLU
TAC GAG GAT GAT GGT ACA ACA ATT AAT CGT CAT TAC TAT GAA ATG GCT GTT TTA ACA GAA
1562
LEU ARG GLU HIS VAL ARG ALA GLY ASP VAL SER ILE VAL GLY SER ARG GLN TYR ARG ASP
CTT CGG GAG CAT GTT CGG GCA GGA GAT GTT TCC ATT GTT GGC AGC AGA CAA TAT AGG GAT

FIG. 8T

1622
PHE GLU GLU TYR LEU PHE SER GLU ASP THR TRP ASN GLN SER LYS GLY ASN THR ARG LEU
TTT GAG GAA TAT TTG TTT TCG GAA GAT ACA TGG AAT CAA TCG AAG GGG AAT ACG AGA TTA
1682
SER VAL SER LEU SER PHE GLU ASP TYR ILE THR GLU ARG THR SER SER PHE ASN GLU ARG
TCA GTT AGT TTA TCA TTC GAA GAT TAT ATA ACG GAG AGA ACC AGC AGC TTT AAT GAA AGG
1742
LEU LYS TRP LEU ALA ALA ASN SER ASN LYS LEU ASP GLY VAL SER LEU GLU LYS GLY LYS
TTA AAG TGG TTA GCT GCC AAT TCC AAT AAG TTA GAT GGG GTT TCT CTT GAA AAA GGA AAG
1802
LEU SER LEU ALA ARG LEU GLU LYS ASP VAL PRO GLU GLU ALA LYS LYS PHE SER ALA SER
CTA TCA CTT GCA CGC TTA GAA AAA GAT GTT CCA GAA GAA GCA AAA AAA TTT AGT GCA AGC
1862
LEU TYR GLN MET LEU PRO ARG ILE LYS LEU THR ASP LEU LEU MET ASP VAL ALA HIS ILE
CTT TAT CAG ATG CTA CCA AGA ATA AAA TTA ACT GAT TTA CTC ATG GAT GTG GCC CAT ATA
1922
THR GLY PHE HIS GLU GLN PHE THR HIS ALA SER ASN ASN ARG LYS PRO ASP LYS GLU GLU
ACA GGA TTT CAT GAG CAA TTC ACT CAT GCT TCC AAT AAT CGA AAA CCA GAT AAG GAA GAA
1982
THR ILE ILE ILE MET ALA ALA LEU LEU GLY MET GLY MET ASN ILE GLY LEU SER LYS MET
ACA ATC ATT ATC ATG GCT GCC CTT TTA GGA ATG GGA ATG AAT ATT GGC TTG AGC AAG ATG
2042
ALA GLU ALA THR PRO GLY LEU THR TYR LYS GLN LEU ALA ASN VAL SER GLN TRP ARG MET
GCC GAA GCC ACA CCC GGA CTT ACA TAT AAG CAA CTA GCC AAT GTA TCT CAA TGG CGC ATG
2102
TYR GLU ASP ALA MET ASN LYS ALA GLN ALA ILE LEU VAL ASN PHE HIS HIS LYS LEU GLN
TAT GAA GAT GCC ATG AAT AAA GCC CAA GCC ATA TTA GTA AAC TTT CAT CAT AAA TTA CAA
2162
LEU PRO PHE TYR TRP GLY ASP GLY THR THR SER SER SER ASP GLY MET ARG MET GLN LEU
TTG CCT TTC TAT TGG GGC GAC GGT ACA ACA TCT TCG TCA GAT GGT ATG AGA ATG CAG CTA

FIG. 8U

```
2222
GLY VAL SER SER LEU HIS ALA ASP ALA ASN PRO HIS TYR GLY THR GLY LYS GLY ALA THR
GGT GTT TCA TCA CTA CAT GCA GAT GCA AAT CCA CAT TAT GGA ACT GGA AAA GGA GCC ACC
2282
ILE TYR ARG PHE THR SER ASP GLN PHE SER SER TYR TYR THR LYS ILE ILE HIS THR ASN
ATC TAC CGA TTT ACA AGT GAT CAA TTC TCT TCT TAC TAC ACA AAG ATT ATT CAT ACT AAT
2342
SER ARG ASP ALA ILE HIS VAL LEU ASP GLY LEU LEU HIS HIS GLU THR ASP LEU ASN ILE
TCA AGA GAT GCG ATT CAT GTT TTG GAT GGT TTG TTA CAT CAT GAG ACG GAT CTA AAC ATA
2402
GLU GLU HIS TYR THR ASP THR ALA GLY TYR THR ASP GLN ILE PHE GLY LEU THR HIS LEU
GAG GAA CAT TAT ACA GAC ACT GCC GGT TAC ACT GAC CAA ATA TTC GGA CTG ACT CAT TTA
2462
LEU GLY PHE LYS PHE ALA PRO ARG ILE ARG ASP LEU SER ASP SER LYS LEU PHE THR ILE
TTA GGA TTT AAA TTT GCC CCA AGA ATA AGG GAT TTA TCG GAC TCA AAA TTA TTT ACG ATA
2522
ASP LYS ALA SER GLU TYR PRO LYS LEU GLU ALA ILE LEU ARG GLY GLN ILE ASN THR LYS
GAT AAA GCA AGT GAG TAT CCA AAA CTA GAA GCC ATT TTA CGT GGA CAA ATA AAT ACA AAG
2582
VAL ILE LYS GLU ASN TYR GLU ASP VAL LEU ARG LEU ALA HIS SER ILE ARG GLU GLY THR
GTC ATT AAA GAA AAT TAT GAG GAT GTT TTG CGA TTA GCT CAT TCT ATA AGG GAG GGA ACA
2642
AGT TTC AGC ATC CCT TAT TAT GGG GAA GCT AGG TTC CTA TTC AAG ACA AAA CAG CTT AGC
VAL SER ALA SER LEU ILE MET GLY LYS LEU GLY SER TYR SER ARG GLN ASN SER LEU ALA
GTT TCA GCA TCC CTT ATT ATG GGG AAG CTA GGT TCC TAT TCA AGA CAA AAC AGC TTA GCT
2702
THR ALA LEU ARG GLU MET GLY ARG ILE GLU LYS THR ILE PHE ILE LEU ASN TYR ILE SER
ACA GCC TTA CGT GAG ATG GGC CGA ATA GAA AAA ACG ATC TTT ATT TTG AAT TAT ATA TCG
```

FIG. 8V

2762
ASP GLU SER LEU ARG ARG LYS ILE GLN ARG GLY LEU ASN LYS GLY GLU ALA MET ASN GLY
GAT GAA TCA TTA AGA AGA AAA ATA CAA AGA GGA TTG AAT AAA GGA GAA GCC ATG AAT GGA
2822
LEU ALA ARG ALA ILE PHE PHE GLY LYS GLN GLY GLU LEU ARG GLU ARG THR ILE GLN HIS
TTG GCA AGA GCT ATT TTC TTC GGA AAA CAA GGT GAG CTT AGA GAA CGC ACC ATA CAG CAT
2882
GLN LEU GLN ARG ALA SER ALA LEU ASN ILE ILE ILE ASN ALA ILE SER ILE TRP ASN THR
CAA TTG CAA AGA GCC AGT GCT TTA AAC ATA ATT ATC AAT GCT ATA AGT ATT TGG AAT ACT
2942
TCT CCA CCT AAC AAC AGC AGT TGA ATA TAA AAA ACG GAC AGG TAG CTT TAA TGA AGA TTT
LEU HIS LEU THR THR ALA VAL GLU TYR LYS LYS ARG THR GLY SER PHE ASN GLU ASP LEU
CTC CAC CTA ACA ACA GCA GTT GAA TAT AAA AAA CGG ACA GGT AGC TTT AAT GAA GAT TTG
3002
LEU HIS HIS MET SER PRO LEU GLY TRP GLU HIS ILE ASN LEU LEU GLY GLU TYR HIS PHE
TTA CAC CAT ATG TCG CCC TTA GGT TGG GAA CAT ATT AAT TTA CTA GGA GAA TAC CAT TTT
3062
ASN SER GLU LYS VAL VAL SER LEU ASN SER LEU ARG PRO LEU LYS LEU SER
AAC TCA GAG AAA GTA GTC TCA TTA AAT TCT TTA AGA CCA CTA AAA CTT TCT TAA CGT TG
3121
TTA AAA ACG AGG GAT TCG TCA GGA AAA TAG GCT TAG CGT TGT AAA TCC GCA TTT TCC TGA
3181
CGC TAC CCC

FIG.8W

*Sac*I
GAGCTCTTCCTTCAACGCACTTCTGTACCAAGAGTTGTTGTC 42

CATTTGATCACTAACAATAGCTTCCCCTGCTTTCTTCAAGCCCTTTGTCATAAAATCGTTAGATTTTCA 111

TCATAAAAATACGAGAAAGACAACAGGAAGACCGCAAATTTTCTTTTCTTTTCCTAGGTACACTGAATG 180

RBS M K K I A V L F G G
TAACCTTAAAAGAAAAAAAGGAAAGGAAGAAAATGATGAAAAAAATTGCCGTTTTATTTGGAGGG 244

N S P E Y S V S L T S A A S V I Q A I D
AATTCTCCAGAATACTCAGTGTCACTAACCTCAGCAGCAAGTGTGATCCAAGCTATTGAC 304

P L K Y E V M T I G I A P T M D W Y W Y
CCGCTGAAATATGAAGTAATGACCATTGGCATCGCACCAACAATGGATTGGTATTGGTAT 364

Q G N L A N V R N D T W L E D H K N C H
CAAGGAAACCTCGCGAATGTTCGCAATGATACTTGGCTAGAAGATCACAAAAACTGTCAC 424

Q L T F S S Q G F I L G E K R I V P D V
CAGCTGACTTTTTCTAGCCAAGGATTTATATTAGGAGAAAAACGAATCGTCCCTGATGTC 484

L F P V L H G K Y G E D G C I Q G L L E
CTCTTTCCAGTCTTGCATGGGAAGTATGGCGAGGATGGCTGTATCCAAGGACTGCTTGAA 544

L M N L P Y V G C H V A A S A L C M N K
CTAATGAACCTGCCTTATGTTGGTTGCCATGTCGCTGCCTCCGCATTATGTATGAACAAA 604

FIG. 9A

```
 W  L  L  H  Q  L  A  D  T  M  G  I  A  S  A  P  T  L  L  L
TGGCTCTTGCATCAACTTGCTGATACCATGGGAATCGCTAGTGCTCCCACTTTGCTTTTA  664

 S  R  Y  E  N  D  P  A  T  I  D  R  F  I  Q  D  H  G  F  P
TCCCGCTATGAAAACGATCCTGCCACAATCGATCGTTTTATTCAAGACCATGGATTCCCG  724

 I  F  I  K  P  N  E  A  G  S  S  K  G  I  T  K  V  T  D  K
ATCTTTATCAAGCCGAATGAAGCCGGTTCTTCAAAAGGGATCACAAAAGTAACTGACAAA  784

 T  A  L  Q  S  A  L  T  T  A  F  A  Y  G  S  T  V  L  I  Q
ACAGCGCTCCAATCTGCATTAACGACTGCTTTTGCTTACGGTTCTACTGTGTTGATCCAA  844

 K  A  I  A  G  I  E  I  G  C  G  I  L  G  N  E  Q  L  T  I
AAGGCGATAGCGGGTATTGAAATTGGCTGCGGCATCTTAGGAAATGAGCAATTGACGATT  904

 G  A  C  D  A  I  S  L  V  D  G  F  F  D  F  E  E  K  Y  Q
GGTGCTTGTGATGCGATTTCTCTTGTCGACGGTTTTTTTGATTTTGAAGAGAAATACCAA  964

 L  I  S  A  T  I  T  V  P  A  P  L  P  L  A  L  E  S  Q  I
TTAATCAGCGCCACGATCACTGTCCCAGCACCATTGCCTCTCGCGCTTGAATCACAGATC 1024

 K  E  Q  A  Q  L  L  Y  R  N  L  G  L  T  G  L  A  R  I  D
AAGGAGCAGGCACAGCTGCTTTATCGAAACTTGGGATTGACGGGTCTGGCTCGAATCGAT 1084

 F  F  V  T  N  Q  G  A  I  Y  L  N  E  I  N  T  M  P  G  F
TTTTTCGTCACCAATCAAGGAGCGATTTATTTAAACGAAATCAACACCATGCCGGGATTT 1144
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FIG. 9B

```
 T  G  H  S  R  Y  P  A  M  M  A  E  V  G  L  S  Y  E  I  L
ACTGGGCACTCCCGCTACCCAGCTATGATGGCGGAAGTCGGGTTATCCTACGAAATATTA  1204

 V  E  Q  L  E  A  L  A  E  E  D  K  R  *
GTAGAGCAATTGATTGCACTGGCAGAGGAGGACAAACGATGAACACATTACAATTGATCAATA  1267

AAAACCATCCATTGAAAAAAAATCAAGAGCCCCCGCACTTAGTGCTAGCTCCTTTTAGCGATCACGATG  1336

TTTACCTGCAG
      PstI                                                          1347
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FIG. 9C

```
VanC  --MKKIAVLF GGNSPEYSVS LTSAASVIQA IDPLKYEVMT IGIAPTMDWY WYQGNLANVR NDTWLEDHKN CHQLTFSSQG FILGEKRIVP ---------D
VanA  MNRIKVAILF GGCSEEHDVS VKSAIEIAAN INKEKYEPLY IGITKSGVWK MCEKPCAEWE NDNCYSAVLS PDKKMHGLLV KKNHEYEINH --------VD
DdlA  MEKLRVGIVF GGKSAEHEVS LQSAKNIVDA IDKSRFDVVL LGIDKQGQWH VSDASHYLLN ADDPAHIALR PSATSLAQVP GKHEHQLIDA QNGQPLPTVD
DdlB  -MTDKAIVLL GGTSAEREVS LNSGAAVLAG LREGGIDAYP VDPKEVDVTQ LKSMGFQKV- ---------- ---------- ---------- ----------
          CCCCCC II I I  II C IC  C    C     C    C C
                    domaine 1

                  <--1-->
VanC  VLFPVLHGKY GEDGCIQGLL ELMNLPYVGC HVAASALCMN KWLLHQLADT MGIASAPTLL LSRYEND--- PATIDRFIQD HGFPIFIKPN EAGSSKGITK
VanA  VAFSALHGKS GEDGSIQGLF ELSGIPFVGC DIQSSAICMD KSLTYIVAKN AGIATPAFWV INKDDRP--- ------VAAT FTYPVFVKPA RSGSSFGVKK
DdlA  VIFPIVHGTL GEDGSLQGML RVANLPFVGS DVLASAACMD KDVTKRLLRD AGLNIAPFIT LTRANRHNIS FAE---VESK LGLPLFVKPA NQGSSVGVSK
DdlB  --FIALHGRG GEDGTLQGML ELMGLPYTGS GVMASALSMD KLRSKLLWQG AGLPVAPWVA LTRAEFEKGL SDKQLAEISA LGLPVIVKPS REGSSVGMSK
        I  CII   IIIICCIICC    CI  IC  C  II CI  I    C    IC       CCC                    ICCCII   III IC I
                                      domaine 2

VanC  VTDKTALQSA LTTAFAYGST VLIQKAIAGI EIGCGILGNE -QLTIGACDA ISLVDGFFDF EEKYQLIS-- --ATITVPAP LPLALESQIK EQAQLLYRNL
VanA  VNSADELDYA IESARQYDSK ILIEQAVSGC EVGCAVLGNS AALVVGEVDQ IRLQYGIFRI HQEVEPEKGS ENAVITVPAD LSAEERGRIQ ETAKKIYKAL
DdlA  VTSEEQYATA VALAFEFDHK VIVEQGIKGR EIECAVLGND NP----QAST CGEIVLTSDF YAYDTKYIDE DGAKVVVPAA IAPEINDKIR AIAVQAYQTL
DdlB  VVAENALQDA LRLAFQHDEE VLIEKWLSGP EFTVAILGEE IL-------P SIRIQPSGTF YDYEAKYLSD ETQYFC-PAG LEASQEANLQ ALVLKAWTTL
      I       I C  I      CCC  CC I  IC  CCII                                        II  C       C        I
                domaine 3

                                  <--2-->
VanC  GLTGLARIDF FVTNQGAIYL NEINTMPGFT GHSRYPAMMA EVGLSYEILV EQLIALAEED KR
VanA  GCRGLARVDM FLQDNGRIVL NEVNTLPGFT SYSRYPRMMA AAGIALPELI DRLIVLALKG
DdlA  GCAGMARVDV FLTPENEVVI NEINTLPGFT NISMYPKLWQ ASGLGYTDLI TRLIELALER HAANNALKTT M
DdlB  GCKGWGRIDV MLDSDGQFYL LEANTSPGMT SHSLVPMAAR QAGMSFSQLV VRILELAD
      I  I CICIC CC    C C  I II IICI  I  I      IC   IC  CC II
                domaine 4
```

FIG. 10

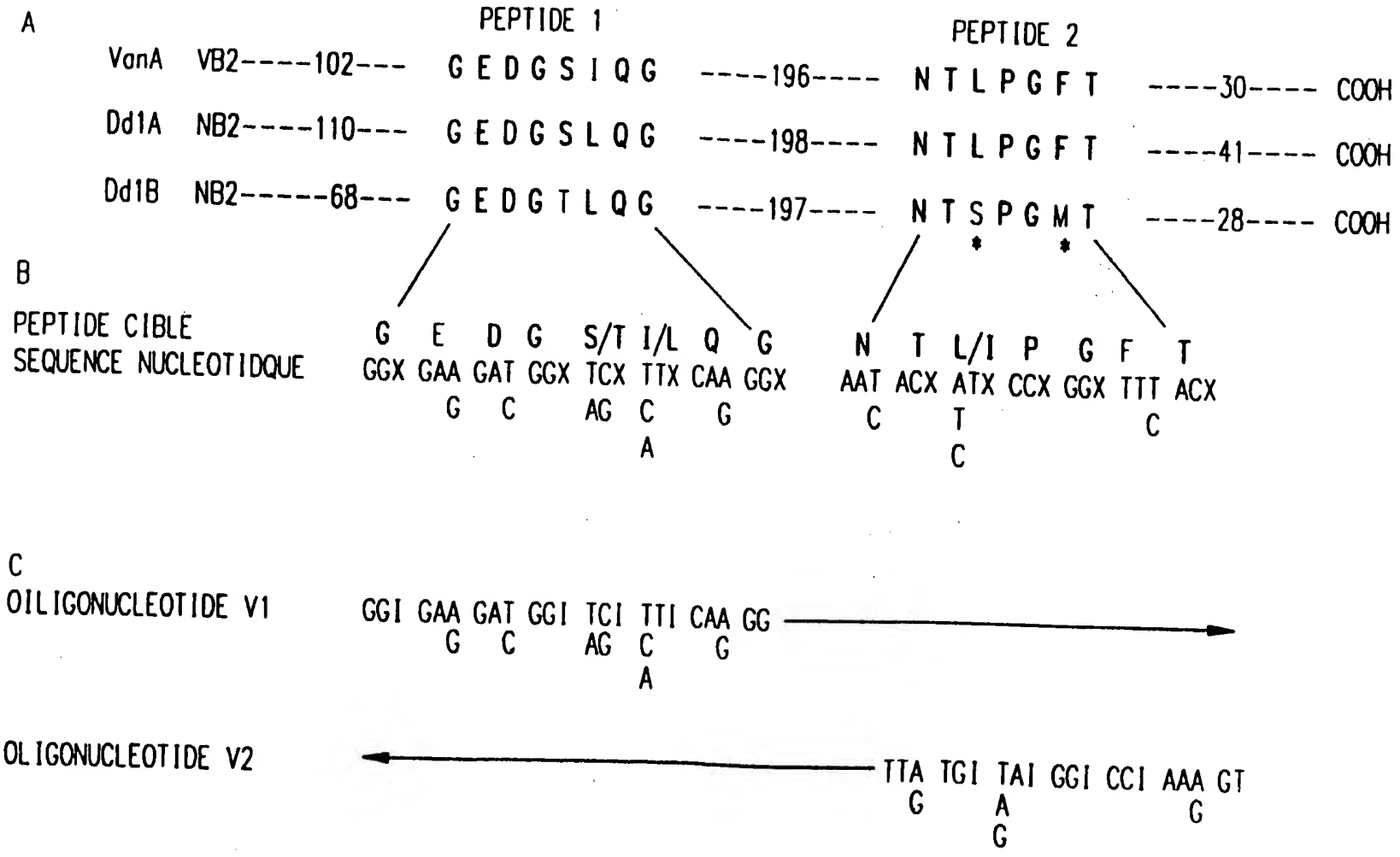

FIG. 11

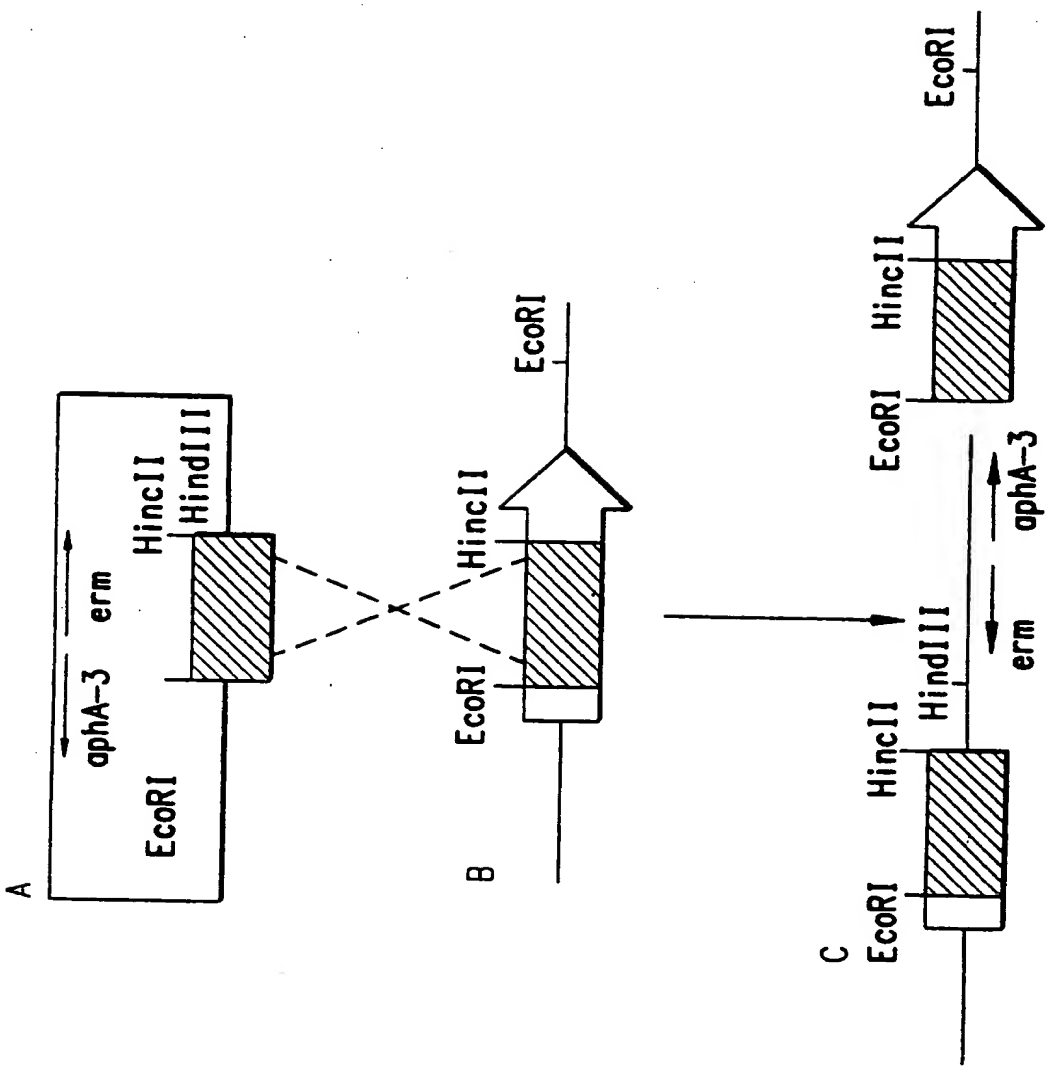
A
aphA-3
erm
HincII
HindIII
EcoRI
B
EcoRI
HincII
EcoRI
C
EcoRI
HincII
EcoRI
aphA-3
erm
HindIII
HincII
EcoRI

FIG.12

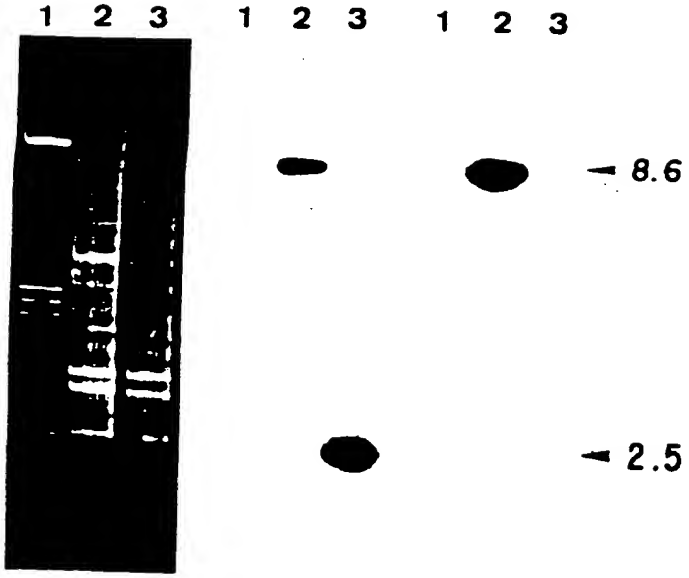

FIG. 13

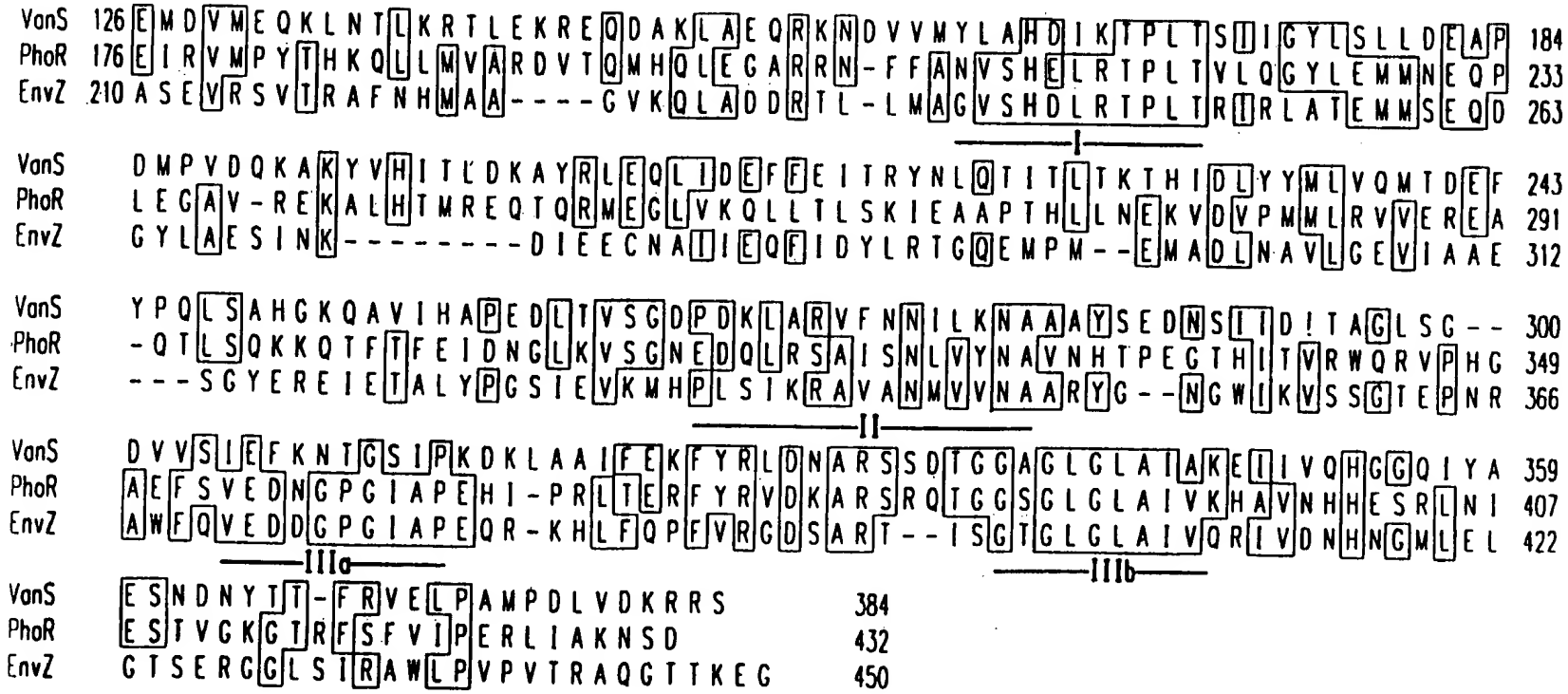

FIG. 14

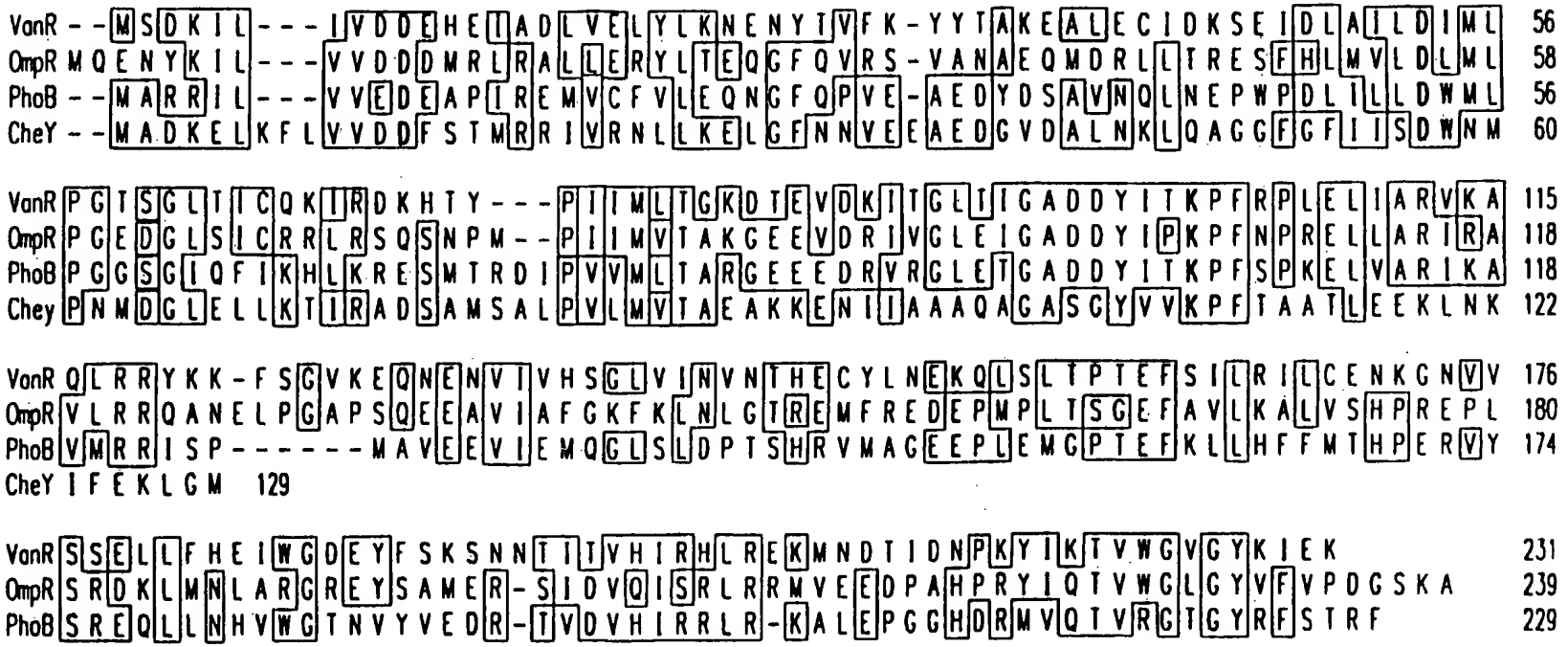

FIG. 15